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FINAL
SITE INSPECTION PRIORITIZATION REPORT
ELIZABETH COAL GAS SITE #2
ELIZABETH, NEW JERSEY

CERCLIS ID No.: NJD981082902

Volume 1 of 2

29 November 1993

Work Order No.: 04200-016-081-0062

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

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CERCLIS ID No.: NJD981082902
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Submitted by:

ROY F. WESTON, INC.
Raritan Plaza I - 4th Floor
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Edison, New Jersey 08837

WESTON/ARCS - Reviewed and Approved

Carolyn J. Serbe
Task Manager — Date: 11/16/93

Thomas A. Varner
Assessment Manager — Date: 11/16/93

Dennis J. Foerter, CHMM
Quality Assurance Representative — Date: 11/19/93

Martin J. O'Neill, CIH
Project Manager — Date: 11/22/93

cs\elizabeth\sip1193.rpt

GENERAL DESCRIPTION AND SITE HISTORY

The Elizabeth Coal Gas Site #2 (CERCLIS ID No. NJD981082902) is an inactive former coal gasification site located in a mixed urban, residential and industrial area of Elizabeth, Union County, New Jersey. The site is located between South Street, High Street, Fourth Avenue and the Elizabeth River under the U.S. Routes 1 and 9 Viaduct (Ref. Nos. 1; 19, pp. 51, 53). The site is comprised of approximately 2 acres and can be divided into two sections. The northern section of the site had formerly been an active salvage area but has since become inactive while the southern portion remains inactive and is used for flood control and a public access baseball field (Ref. Nos. 2; 19, pp. 48, 50, 53).

The site has been owned by Elizabeth Gas Company since 1855 and was used to manufacture coal gas until approximately 1901 (Ref. No. 19, p. 45). The Army Corps of Engineers removed and regraded portions of the property to the west under Route 1 and to the south. These portions of the property are believed to be where the bulk of the wastes may have been deposited on site (Ref. No. 19, p. 50). Presently, the northern section of the property is still owned by Elizabethtown Gas Light Company (Ref. No. 2). The southern half of the property was donated to the Union County Department of Parks and Recreation by the City of Elizabeth in 1953. This part of the property is part of a flood control project. A small rectangular parcel of property, which encompasses the baseball diamond itself, is owned by the Church of St. Anthony (Ref. No. 19, p. 300).

On December 16, 1986 an initial site visit was conducted by TAMS Consultants, Inc. (TAMS), who was contracted by the New Jersey Department of Transportation (NJDOT) to evaluate the site relative to future plans to widen the viaduct. During this site visit, it was noted that there was water present in the catch basin located adjacent to the South Street Pumping Station and that this water had a strong odor of raw sewage and an oil sheen. These substances were assumed to have origins other than coal gasification wastes. TAMS also reported that quantities of retort slag were scattered about open areas of the site both under the viaduct and in areas disturbed by construction of flood control facilities. This site visit also revealed a number of locations near the viaduct where waste oil appeared to have been dumped in small quantities (Ref. No. 19, p. 136).

From January 27 to February 5, 1987, TAMS investigated the northern portion of the site immediately under the viaduct (Ref. No. 19, p. 137). TAMS reported that minor visual evidence of coal gasification wastes were present in borings and test pits installed, with the exception of some subsurface retort slag. However, every soil sample tested, which were all collected from depths greater than 2 feet below ground surface (BGS), exceeded the New Jersey Department of Environmental Protection and Energy (NJDEPE) soil cleanup criteria for at least one parameter (Ref. No. 19, pp. 141-145). The inorganic contaminants exceeding action levels included cadmium, lead and cyanide. The most significant concentrations of organic contaminants detected were for polycyclic aromatic hydrocarbons (PAHs). High concentrations of other semivolatile organic (dibenzofuran) and inorganic (lead) compounds were detected in association with high PAH concentrations (Ref. No. 19, pp. 145, 150, 151).

On June 12, 1990, the U.S. Environmental Protection Agency (U.S. EPA) Region 2 Field Investigation Team (FIT) (NUS Corporation) conducted a sampling Site Inspection at the Elizabeth Coal Gas Site #2 (Ref. No. 19, p. 221). Analytical results from soil samples collected at the facility indicate that elevated concentrations of volatile and semivolatile organic compounds exist on site. The compounds include benzene, toluene, styrene, xylenes and a number of PAHs including known and suspected carcinogens, all of which are related to the coal gasification process (Ref. No. 19, pp. 11, 12, 54, 83-87, 230). Elevated levels of PAHs and inorganic contaminants, comparable to concentrations found in on-site samples, were also found in the "background" sample, thus indicating that off-site locations may have been impacted by previous operations (Ref. No. 19, pp. 232, 234). Table 1 of this report provides a summary of the compounds detected in the soil samples at elevated concentrations. A table further detailing organic compounds detected in the fourteen soil samples taken is provided in Reference 19 (pp. 10-11, 225-299).

Since the Site Inspection (SI) was completed in 1990, a remedial investigation (RI) was conducted by Dames & Moore for the NJDEPE. Phase I of the RI included the installation of 9 monitoring wells from March through September 1992. The RI report was submitted October 30, 1992 and contained results from groundwater and soil sampling conducted during Phase I of the RI. A significant concentration (2,500 parts per billion (ppb)) of benzene was found in one of the upgradient wells while other contaminants found in groundwater, surficial and subsurficial soil were typical of coal gas facility wastes. Phase II of the RI is expected to commence in three to four months and will include the installation of additional monitoring wells, test pits and borings (Ref. No. 3). Recently, one of the old buildings on-site burned down. The fire is being attributed to vandalism (Ref. No. 2). A recent off-site reconnaissance performed by Roy F. Weston, Inc. (WESTON) on November 3, 1993 reveals that the baseball field is still maintained in playing condition. In addition, access to the site is unrestricted due to at least one opening along High Street in the fence surrounding the site (Ref. No. 4).

EVALUATION OF EXISTING INFORMATION AND SITE INSPECTION REPORT

Existing information and analytical data, primarily from the 1990 Site Inspection Report and supporting documentation file, were used to conduct an evaluation of the site. Updated and additional information and data were also collected in order to further evaluate the site and determine whether further CERCLA action is required. Specifically, the groundwater migration pathway was updated to include wells within a 4-mile radius of the site and the surface water migration pathway was updated to include receptors within 15 miles downstream of the site. In addition, the air migration pathway was evaluated with respect to sensitive environments, including threatened and endangered species.

Table 1: Summary of Compounds with Elevated Concentration Levels Detected in Soil Samples Collected at the Elizabeth Coal Gas Site #2 by the NUS Corp. Region 2 FIT on June 12, 1990

COMPOUND	ELEVATED CONCENTRATION*	BACKGROUND CONCENTRATION**
VOLATILES[1]		
Carbon Disulfide	10,000E	ND
Benzene	82,000E	ND
Toluene	59,000E	ND
Styrene	14,000E	ND
Total Xylenes	68,000E	ND
SEMIVOLATILES[2]		
Naphthalene	950 - 270,000E	J
2-Methylnaphthalene	3,300,000E	J
Acenaphthylene	990 - 2,600,000E	J
Acenaphthene	850 - 460,000E	J
Dibenzofuran	860 - 2,300,000E	J
Phenanthrene	220,000E	10,000
Anthracene	1,300 - 2,900,000E	J
Flouranthene	27,000 - 140,000E	9,600
Pyrene	26,000 - 140,000E	8,800
Fluorene	1,400 - 2,500,000E	J
Benzo(a)anthracene	14,000 - 2,500,000E	3,600
Chrysene	22,000 - 2,800,000E	5,400
Benzo(b)fluoranthene	16,000 - 1,500,000E	5,000
Benzo(k)fluoranthene	3,200 - 1,400,000E	ND
Benzo(a)pyrene	1,900,000E	3,300
Indeno(1,2,3-cd)pyrene	8,200 - 1,000,000E	2,500
Dibez(a,h)anthracene	3,500 - 570,000E	940
Benzo(g,h,i)perylene	870,000E	3,000
PESTICIDES[3]		
4,4'-DDT	220E-230	J
INORGANICS[4]		
Calcium	13,000 - 15,100	3,980
Cadmium	1.4 - 2.5	J
Selenium	1.7	J
Sodium	1,500 - 2,30	J
Cyanide	2.2	ND

Notes:
All results reported in ug/kg
E - Estimated value
ND - Not detected
J - Estimated value, compound present below contract required quantitation limit (CRQL) but above instrument detection limit (IDL)

* Samples taken between 0-2 feet BGS (S3, S5, S&-S11) (Ref. No. 19, pp. 225-229)
** "Background" sample S14, taken between 0-2 ft BGS (Ref. No. 19, p. 122)
[1] Ref. No. 19, p. 230; [2] Ref. No. 19, pp. 231-232; [3] Ref. No. 19, p. 233; [4] Ref. No. 19, p. 234

HAZARD ASSESSMENT

Groundwater Pathway - A release to groundwater is suspected. According to the NJDEPE case manager for the Elizabeth Coal Gas Site #2, the results of the groundwater sampling conducted during the October 1992 RI revealed that contaminants, which are typical of coal gas facility wastes, were present in site groundwater. However, benzene (2,500 ppb) was measured in one of the upgradient deep groundwater wells. This is not believed to be attributable to the site because relatively low concentrations of benzene have been found in the downgradient monitoring wells. Phase II of the RI will further investigate the benzene contamination (Ref. No. 3).

The aquifer of concern is the Passaic Formation, which was formerly known as the Brunswick Formation (Ref. No. 19, p. 169). This formation is composed of thin-bedded shales, mudstones and sandstones which have a maximum thickness of 6,000 meters (Ref. Nos. 5; 19, p. 174). Groundwater in this formation occurs along joints and fracture zones which decrease in volume with depth (Ref. No. 19, p. 175). Analytical data indicates that soil contamination exists across the site at depths ranging from 0 to 48 inches; therefore, surficial contamination is suspected to be related to the site (Ref. No. 19, p. 225-234). Groundwater exists in the unconsolidated deposits under water table conditions 7 to 10 feet below the ground surface. These deposits are in direct hydraulic connection with the Passaic Formation; therefore, the depth from the lowest point of waste disposal to the aquifer of concern ranges from 3 to 6 feet (Ref. No. 19, pp. 132, 152, 173, 178).

The nearest potable wells are all located approximately 3.75 miles northwest of the site in the Hummocks Wellfield in Union (Ref. No. 6). This wellfield consists of eight wells which are part of an overall system total of over 100 wells supplying 507,000 people. This water is blended prior to distribution at a ratio of 85 percent surface water to 15 percent groundwater; therefore, a total of 6,084 people are served by groundwater from the Hummocks Wellfield (Ref. Nos. 7; 8). Within 4 miles of the site there are a total of 6 additional wells (Roselle Well, St. Walburga Wells (4) and Chandler Avenue Well); however, all of these wells are out of service because of water quality (Ref. No. 6). Although the Bureau of Underground Storage Tanks (BUST) has designated an area of 2,000 feet from municipal water supply wells, as of November 1992 there are no designated well head protection areas in New Jersey (Ref. No. 9).

Surface Water Pathway - A release to surface water is not observed; no surface water sampling is known to have occurred with respect to this site. Because the site is physically located between the limits of a 100-year flood and 500-year flood zone, in addition to being separated from the Elizabeth River (the nearest downslope surface water) by a manmade concrete bulkhead which is approximately 8 to 10 feet higher than the site, a release to surface water is not suspected (Ref Nos. 10; 11; 12; 19, p. 123). Analytical data from soil samples collected at the site indicate that wastes associated with

coal gasification exist in surface and subsurface soils in the southern portion of the site (Ref. No. 19, pp. 225-234). This portion of the site is used for flood control and is lower than surrounding topography. The Elizabeth River flows into the Arthur Kill approximately 2.3 miles downstream of the site. Approximately 2.5 miles of wetland frontage exists contiguous with the surface waters within 15 miles downstream of the site (Ref. No. 11). There are no drinking water intakes within 15 miles downstream of the site (Ref. Nos. 13; 19, p. 51). Both the Elizabeth River and the Arthur Kill are reported to be fisheries (Ref. Nos. 14; 15). The peregrine falcon (*Falco peregrinus*), both a Federal-listed and New Jersey state-listed endangered species, is reported to possibly use the area in the immediate vicinity of the Arthur Kill waterway for feeding and nesting (Ref. No. 16).

Soil Exposure Pathway - Analytical results for soil samples collected at the site by the U.S. EPA Region 2 FIT (NUS Corporation) on June 12, 1990 indicate the presence of elevated concentrations of volatile organic compounds (VOC), semivolatile organic compounds (SVOC), a pesticide and inorganic contaminants (Ref. No. 19, pp. 230-234). The contaminated soil samples were collected from an interval between 0 to 2 feet BGS and contained contaminants measuring three or more times higher on site than "background" levels for the same parameter. The elevated concentrations of these compounds are organized in Table 1 of this report. A recent off-site reconnaissance conducted by WESTON reveals that there are six houses within 200 feet of the site boundary; however, sampling was conducted by NUS Corporation in June 1990 at only one of these houses. The sampling conducted at this residential property was used as a "background" sample and revealed elevated levels of PAHs and inorganic contaminants (Ref. Nos. 4; 19, 99. 232, 234). The recent WESTON off-site reconnaissance also revealed that there are no active commercial or industrial operations on site (Ref. No. 4). The site is completely fenced with a locked gate along Centre Street; however, there is an open gate along High Street which permits unrestricted access to the site (Ref. Nos. 4; 19, pp. 51, 104-105). The site is bordered by residences to the east (Ref. No. 19, pp. 51, 91). A portion of the site is used as a baseball field (Ref. No. 19, p. 105). There are no sensitive environments, as well as no rare or endangered species located on or within 200 feet of the site boundaries (Ref. No. 16).

Air Pathway - There are no analytical data available to determine if a release of contaminants to air has occurred. During the on-site reconnaissance and sampling inspection conducted by NUS Corporation in June 1990, no readings above background were detected in the ambient air by the organic vapor analyzer (OVA) or the HNu photoionization detector (HNu). However, readings above background were detected on at least one of the air monitoring instruments in all subsurface soil sample auger holes. Readings ranged from 0.4 parts per million (ppm) to greater than 1,000 ppm (Ref. No. 19, pp. 110-112). There are approximately 291,810 people living within a 4-mile radius of the site (0 to ¼ mile, 2,780; ¼ to ½ mile, 10,680; ½ to 1 mile, 37,480; 1 to 2 miles, 63,500; 2 to 3 miles, 62,270; 3 to 4 miles, 115,100) (Ref. Nos. 17; 18). Within a 4-

mile radius of the site there are approximately 688 acres of wetlands (Ref. No. 11). Also within this 4-mile radius are other sensitive environments, such as rare species and natural communities, including the New Jersey state-threatened savannah sparrow (*Passerculus sandwichensis*), the New Jersey state-listed endangered least tern (*Sterna antillarum*) and the Federal-listed and New Jersey state-listed endangered American burying beetle (*Nicrophorus americanus*) (Ref. No. 16).

SUMMARY

The existing information, data and additional information collected were sufficient to evaluate the site. This assessment indicates that this site poses a minimal risk to human health and the environment. Although a release of contaminants to groundwater at the facility is suspected due to wastes associated with coal gasification that are reported to be buried in unlined pits on site, there are relatively few groundwater receptors served by wells within 4 miles of the site. With regard to the soil exposure pathway, there are relatively few nearby residences which may be impacted by waste sources at the site. There is no observed or suspected release of contaminants to surface water and there are no surface water intakes which supply drinking water within 15 miles downstream of the site. There are relatively few sensitive environments along the 15-mile surface water migration pathway.

REFERENCES

1. U.S. Environmental Protection Agency Superfund Program, Comprehensive Environmental Response, Compensation, Liability and Information System (CERCLIS), Site/Event Listing, p. 81, October 1, 1992.

2. Phone Conversation Record: Conversation between Ken Ward, Elizabethtown Gas Light Company, and Carolyn J. Serbe, Roy F. Weston, Inc. (WESTON), October 22, 1993. Re: Ownership of property.

3. Phone Conversation Record: Conversation between Greg Zalaskus, New Jersey Department of Environmental Protection and Energy (NJDEPE), and C. Serbe, WESTON, November 3, 1993. Re: Status on remedial activity at site.

4. Field Logbook for Elizabeth Coal Gas Site #2, Document Control No. 04200-16-ADEM, Off-Site Reconnaissance conducted by WESTON on November 3, 1993.

5. New Jersey Academy of Science Bulletin, Vol. 25, No. 2, pp. 25-27, 1980.

6. Letter from Richard A. Sadowski, Elizabethtown Water Company, to C. Serbe, WESTON, October 5, 1993. Re: Maps with Elizabethtown Water Company wells plotted.

7. Phone Conversation Record: Conversation between R. Sadowski, Elizabethtown Water Company, and Richard Settino, WESTON, March 17, 1993. Re: Public supply water system in Union.

8. Project Note from C. Serbe, WESTON, to Elizabeth Coal Gas Site #2 File. Subject: Calculations for population served by Hummocks Wellfield, November 1, 1993.

9. Phone Conversation Record: Conversation between Dan Van Abs, NJDEPE, and Dave Benfer, WESTON, November 16, 1992. Re: Well head protection.

10. Four-Mile Vicinity Map compiled from the U.S. Department of the Interior, Geological Survey, Topographic Maps, 7.5 minute series, "Elizabeth, NJ-NY" Quadrangle, 1967, revised 1981, "Roselle, NJ" Quadrangle, 1955, revised 1981, "Arthur Kill, NY-NJ" Quadrangle, 1966, revised 1981, "Perth Amboy, NJ-NY" Quadrangle, 1956, revised 1981.

REFERENCES (continued)

11. Fifteen-Mile Surface Water Pathway Map compiled from U.S. Department of the Interior, Fish and Wildlife Service National Wetlands Inventory, "Elizabeth, NJ" Quadrangle, "Roselle, NJ" Quadrangle, "Arthur Kill, NY-NJ" Quadrangle, "Perth Amboy, NJ-NY" Quadrangle, "Keyport, NJ-NY" Quadrangle, "South Amboy, NJ-NY" Quadrangle, all based on aerial photography from October 1976.

12. Fax from Nancy Stripe, City of Elizabeth, Department of Public Works, to C. Serbe, WESTON, August 25, 1993. Re: Flood zone information.

13. Letter from John F. Fields, NJDEPE, to Thomas A. Varner, WESTON, September 15, 1993. Re: Surface Water Intakes.

14. Phone Conversation Record: Conversation between Bob Soldwedel, NJDEPE, Bureau of Freshwater Fisheries, and T. Varner, WESTON, May 24, 1993.

15. Phone Conversation Record: Conversation between B. Soldwedel, NJDEPE, and C. Serbe, WESTON, September 2, 1993.

16. Letter from Thomas F. Breden, NJDEPE, Division of Parks and Forestry, to R. Settino, WESTON, September 24, 1993. Re: Sensitive environments and natural heritage data.

17. Letters from Bob Frost, Frost Associates, to Jan Holderness, WESTON, September 1 and September 2, 1993. Re: Population within 4-mile radius of Elizabeth Coal Gas Site #2.

18. Project Note from C. Serbe, WESTON, to Elizabeth Coal Gas Site #2 File. Subject: Calculations of populations rings, November 1, 1993.
ORIGINAL SI IS IN SITE FILE (WHICH DUPLICATE IS)

* 19. Final Draft Site Inspection Report for Elizabeth Coal Gas Site #2, NUS Corporation Region 2 FIT, TDD No. 02-8704-12, September 17, 1990.

* NOTE * ORIGINAL PA'S & SI'S ARE IN THE SITE FILE

A COPY OF ... PAGE 23 ...

... A COPY ...

REFERENCE NO. 1

SELECTION:
SEQUENCE: REGION, STATE, SITE NAME

EVENTS: ALL

EPA ID NO.	SITE NAME / STREET / CITY / COUNTY CODE AND NAME	STATE	ZIP	CONG DIST.	OPRBLE UNIT	EVENT TYPE	EVENT QUAL	ACTUAL START DATE	ACTUAL COMPL DATE	CURRENT EVENT LEAD
NJD001561471	ELECTRO FINISH CORP.				00	DS1			10/01/89	EPA (FUND)
	280 MIDLAND AVENUE					PA1			06/21/90	EPA (FUND)
	SADDLE BROOK	NJ	07662							
	003 BERGEN									
NJD002361665	ELECTRONIC PARTS SPECIALTY CO				00	DS1			04/10/84	STATE(FUND)
	COLES AVE					PA1		01/01/85	01/01/85	EPA (FUND)
	LUMBERTON TWP	NJ	08048			SI1		06/23/88	06/30/88	STATE(FUND)
	005 BURLINGTON									
NJD980529077	ELIZABETH CITY DUMP				00	DS1			10/01/79	EPA (FUND)
	N AVE E & BAY AVE					PA1			08/01/80	EPA (FUND)
	ELIZABETH	NJ	07201			SI1		02/01/80	08/01/80	EPA (FUND)
	039 UNION									
NJD981082894	ELIZABETH COAL GAS SITE #1				00	DS1			04/01/85	STATE(FUND)
	ERIE ST BET 3RD AND FLORIDA ST					PA1		04/01/85	04/30/85	STATE(FUND)
	ELIZABETH	NJ	07201			SI1	NFA	04/01/90	04/01/90	EPA (FUND)
	039 UNION									
NJD981082902	ELIZABETH COAL GAS SITE #2				00	RS1		11/08/90	03/28/91	EPA (FUND)
	406 SOUTH STREET					DS1			04/01/85	STATE(FUND)
→	ELIZABETH	NJ	07202			PA1		04/01/85	04/30/85	STATE(FUND)
	039 UNION					SI1		07/01/90	09/25/90	EPA (FUND)
NJD980505119	ELIZABETH WASTE DSPL #1				00	DS1			07/01/81	EPA (FUND)
	CROWS MILL RD					PA1			09/01/80	EPA (FUND)
	KEASBEY	NJ	08832			SI1		09/01/80	02/01/82	EPA (FUND)
	023 MIDDLESEX									
NJD980505101	ELIZABETH WASTE DSPL #2				00	DS1			02/01/79	EPA (FUND)
	KING GEORGE RD					PA1			08/01/80	EPA (FUND)
	FORDS	NJ	08863			SI1	NFA	07/01/81	02/01/82	EPA (FUND)
	023 MIDDLESEX									

NOT
ROUTE
(6)

REFERENCE NO. 2

WESTON

C J Serbe
Originator

0048T

PHONE CONVERSATION RECORD

Conversation with:

Name Ken Ward

Company Elizabethtown Gas Light Co.

Address

Phone ~~201~~ 908/289-5000 x6524

Subject Ownership of 406 South St.

Date 10/22/93

Time 10:00 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 04200-016-081-0062-03

Notes: Mr. Ward informed me that since 1855 Elizabethtown Gas Light Co. has owned the property. He said all of the buildings have been demolished except for a tool shed. This is due to future construction to realign Rt 1 + Rt 9 roadways. I asked him if he heard of Vignola Salvage Company as a potential renter in the past and he said no.

☒ File Eliz. Coal Gas Site #2

☐ Tickle File ___/___/___

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action: Possibly take a trip up to see site on Thursday (pictures).

Originator's Initials CJS

RFW 110-4-83

REFERENCE NO. 3

WESTON

C. J Serbe
Originator

~~0029 T~~ CJS
0050 T

PHONE CONVERSATION RECORD

Conversation with:
Name Greg Zalaskus
Company NJDEPE - Bureau of Case Mgnt
Address _____
_____
Phone 609/633-0719

Date 11 / 3 / 93
Time 9:15 (AM)/PM

☐ Originator Placed Call
☒ Originator Received Call
W.O. NO. 04200-016-081-006205

Subject Remedial Activity @ Eliz. Coal Gas Site #2

Notes: I needed to talk to Greg in more detail regarding remedial activity at the Elizabeth Coal Gas Site #2. The Phase I of the Remedial Investigation Conducted by Dames + Moore included the installation of 9 shallow + deep monitoring wells. These wells were installed between March thru September 1992. Dames + Moore submitted an RI report on Oct 30, 1992 with results of groundwater sampling, surficial and subsurficial soil sampling. The results mostly showed contaminants typical of coal gas sites. However, an alarming amount of benzene (2500 ppb) in one of the deep upgradient wells, but Greg believes this to be from contamination not related to the Eliz Coal Gas site #2. There was little benzene in the downgradient wells. Overall, GW wasn't too bad - exceedances included metals + SVOCs but in no alarming amounts. An offsite upgradient well will be put in soon to further investigate the high benzene concentrations. Phase II of the RI, called the Supplemental RI, should be done being revised by end of this quarter + work should start up within 3 to 4 months. This work will include putting in additional monitoring wells and soil sampling in test pits and soil borings.

☒ File # Elizabeth Coal Gas Site #2
☐ Tickle File ___/___/___
☐ Follow-Up By: _____
☐ Copy/Route To: _____
_____

Follow-Up-Action: _____
_____
_____
_____

Originator's Initials CJS

RFW 110-4-83

REFERENCE NO. 4

Document Control #04200-16-ADEM

Elizabeth Coal Gas Site #2

11/3/93

CS- Carrie Serbe

RS- Rich Settino

CS & RS

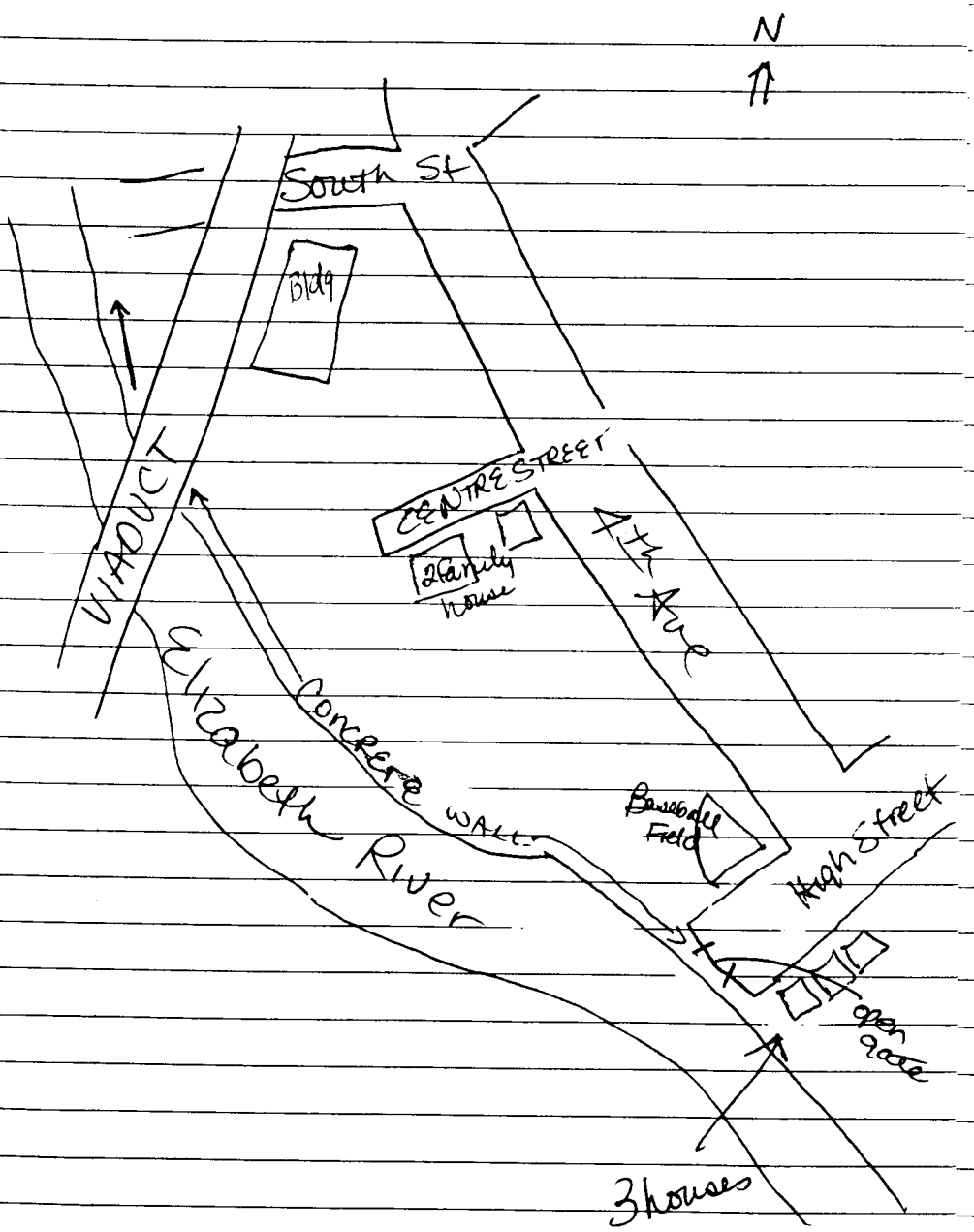
1135: arrive at Eliz. Coal Gas Site #2

- apparently nothing has changed since SI done
- fence open which leads to baseball field area of site - access unrestricted
- Baseball field still here & it looks somewhat maintained enough to play on
- Old brick building towards the viaduct looks burnt, fire may have occurred, this is the only building left on site - no observed active business on site
- observed one monitoring well in the northwest (flood control) area of site
- took P1 - P5 (panoramic) pictures from east to west of site (baseball field 3rd base line to concrete wall)
- 3 houses along High Street ~~along~~ within 200 feet of site
- P. Vetre Construction & Development Corp located in building to east of site
- One Two-family house located on Center St. within 200 feet of site - road being paved today.

C Serbe

Do 2 Elizabeth Coal Gas Site #2

11:50 CS, RS Cave site



Cfleck

REFERENCE NO. 5

U.S. Academy of Science Bulletin
Vol. 25, No. 2
pp. 25-27, 1980

THE LATEST TRIASSIC AND EARLY JURASSIC FORMATIONS OF THE NEWARK BASIN (EASTERN NORTH AMERICA, NEWARK SUPERGROUP): STRATIGRAPHY, STRUCTURE, AND CORRELATION

PAUL E. OLSEN

Bingham Laboratories, Department of Biology
Yale University
New Haven, Connecticut 06520

ABSTRACT. *Newark Supergroup deposits of the Newark Basin (New York, New Jersey, and Pennsylvania) are here divided into nine formations called (from the bottom up): Stockton Formation (maximum 1800 m); Lockatong Formation (maximum 1150 m); Passaic Formation (maximum 6000 m); Orange Mountain Basalt (maximum 200 m); Feltville Formation (maximum 600 m); Preakness Basalt (maximum +300 m); Towaco Formation (maximum 340 m); Hook Mountain Basalt (maximum 110 m); and Boonton Formation (maximum +500 m). The latter seven formations are new and result from subdividing the Brunswick Formation and Watchung Basalt of Kümmel and Darton. Each formation is characterized by its own suite of lithologies, the differences being especially obvious in the number, thickness, and nature of their gray and black sedimentary cycles (or lack thereof).*

Newark Basin structure still escapes comprehensive understanding, although it is clear that faults (predominantly normal) and onlaps bound both the eastern and western edges of the basin. The cumulative thickness of formations and the apparent movement of the faults is greater on the western than the eastern side, however.

Fossils are abundant in the sedimentary formations of the Newark Basin and provide a means of correlating the sequence with other early Mesozoic areas. The Stockton, Lockatong, and most of the Passaic Formation are Late Triassic (?Middle and Late Carnian — Rhaetic) while the uppermost Passaic Formation (at least locally) and younger beds appear to be Early Jurassic (Hettangian and Sinemurian) in age. The distribution of kinds of fossils is intimately related to sequences of lithologies in sedimentary cycles.

Manuscript received 2 Jan 1980.
Manuscript accepted 14 Jan 1980
Revised manuscript received 16 Sep 1980.

INTRODUCTION

Despite well over a century of interest in the early Mesozoic Newark Supergroup of eastern North America, many fundamental aspects of its historical and structural geology remain unexplored. In part, this is due to the complexity of stratigraphic and structural relations in the individual basins, coupled with the rarity of continuous exposures. As a result, much of our accepted understanding of the Newark Supergroup has been based on incomplete observations and opinion. The purpose of this paper is to provide a more thorough observational foundation against which past hypotheses may be assessed and on which future work may be based. Emphasis is placed on the younger beds of the Newark Basin, for they have never been examined in detail, and a new stratigraphic framework is proposed. These younger Newark Basin beds provide us with a key to understanding the entire basin column, which in turn is crucial to the context in which early Mesozoic organic evolution, continental sedimentation, and tectonic development are to be studied.

REGIONAL SETTING

Triassic and Jurassic Newark Supergroup rocks (Figure 1) (Olsen, 1978; Van Houten, 1977) occupy numerous elongate basins in eastern North America and consist of predominantly detrital fill locally more than 10,000 m thick. In most

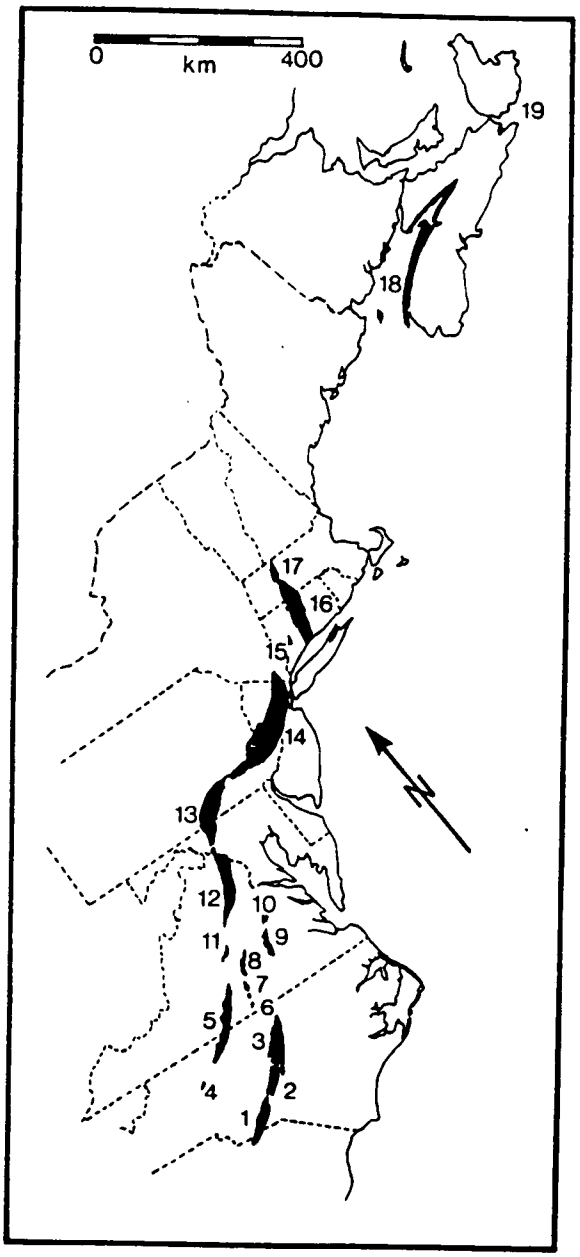


FIG. 1. Newark Supergroup deposits exposed in eastern North America: 1, Wadesboro Basin of Chatham Group; 2, Sanford Basin of Chatham Group; 3, Durham Basin of Chatham Group; 4, Davie County Basin; 5, Dan River — Danville Basins of Dan River Group; 6, Scottsburg Basin; 7, Basins south of the Farmville Basin; 8, Farmville Basin. 9, Richmond Basin; 10, Taylorsville Basin; 11, Scotsville Basin; 12, Culpeper Basin (Culpeper Group; 13, Gettysburg Basin; 14, Newark Basin; 15, Pomperaug Basin; 16, Hartford Basin; 17, Deerfield Basin; 18, Fundy Basin (Fundy Group); 19, Chedabucto Basin (= Orpheus Graben?). Data primarily from

areas, red clastics are the dominant sedimentary rocks and tholeiitic, intrusive and extrusive diabases and basalts are the most common volcanics. These unconformably overlie (or rarely intrude) Precambrian and Palaeozoic rocks and are overlain by post-Jurassic rocks of the Coastal Plain, or alluvium and soils.

The Newark Basin is the most northerly of three Newark Supergroup basins lying in an arcuate belt stretching from southern New York to central Virginia (Figure 2). The region has attracted the attention of researchers since the beginnings of North American geological work (Kalm, 1753-1761; Schopf, 1783-1784); by about 1890 the deposit had been mapped out (Lyman, 1895; Cook, 1868) and by 1900 the currently used rock-stratigraphic framework was established (Table 1). Kümmel (1897) divided the Newark Basin sequence into three formations: the Stockton, Lockatong, and Brunswick. As recognized by Kümmel, the Stockton Formation (maximum thickness 1800 m) is the basal deposit consisting of thick beds of buff or cream colored conglomerate and sandstone, and red siltstone and sandstone. Throughout the exposed central portion of the Newark Basin, Kümmel recognized the Lockatong Formation (maximum thickness 1150 m) which is made up of gray and black siltstone arranged, as later shown by Van Houten (1969), in distinctive sedimentary cycles (Figure 4). The youngest formation Kümmel called the Brunswick. Throughout the Newark Basin, the lower Brunswick consists of sandstone and conglomerate and clusters of laterally persistent cycles of gray and black siltstone similar to the Lockatong Formation (Kümmel, 1897, 1898; McLaughlin, 1943; Van Houten, 1969). The upper Brunswick, on the other hand, is made up of three major extrusive basalt sheets which Darton (1890) called the Watchung Basalt, two major interbedded sedimentary units, and a thick overlying sedimentary unit. The latter sedimentary sequences have escaped even preliminary lithologic description.

Field work by this author during the past few years has shown that Kümmel's Brunswick For-

Calver, 1963, King, *et al.*, 1944; Van Houten, 1977; and Olsen, 1978.

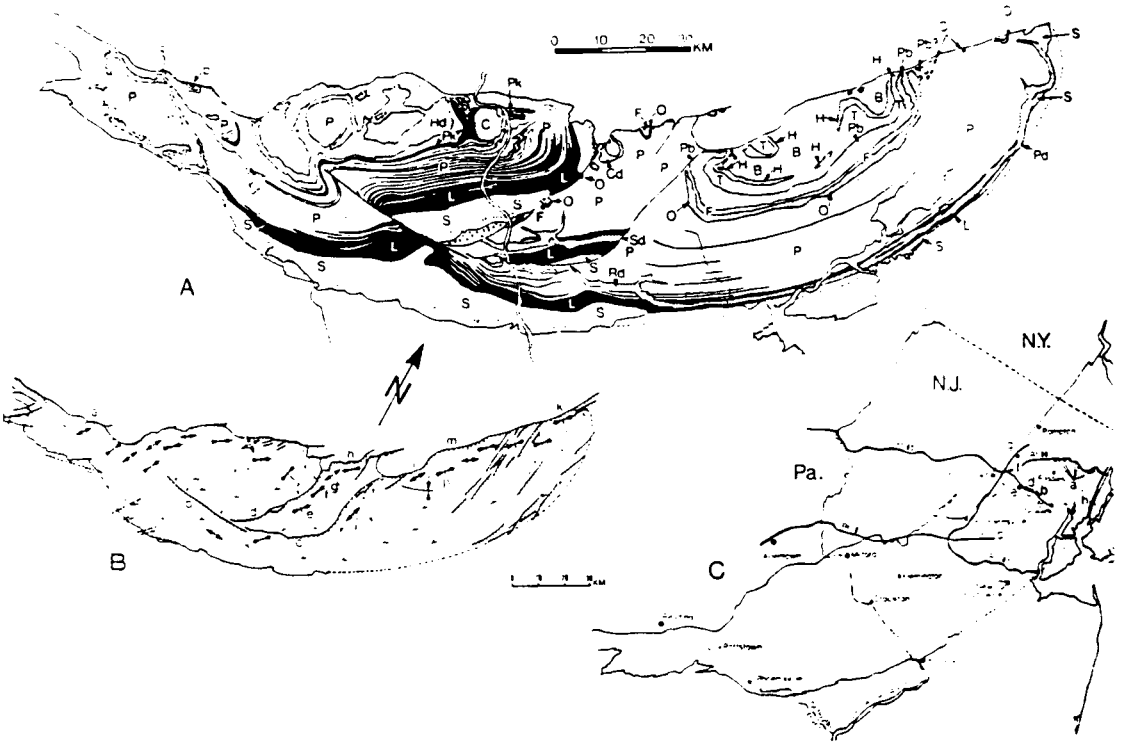


FIG. 2. The Newark Basin. A, geologic map showing distribution of formations, conglomerate facies ular stipple), and major clusters of detrital cycles in Passaic Formation (black lines). Abbreviations of form and intrusive bodies as follows: B, Boonton Formation; C, Coffman Hill Diabase; Cd, Cushetunk Mountain D F, Feltville Formation; H, Hook Mountain Basalt; Hd, Haycock Mountain Diabase; Jb, Jacksonwald Bas Lockatong Formation; O, Orange Mountain Basalt; P, Passaic Formation; Pb, Preakness Basalt; Pd, Palisad base; Pk, Perkasie Member of Passaic Formation; Rd, Rocky Hill Diabase; S, Stockton Formation; Sd, Sc Mountain Diabase; T, Towaco Formation.

B, Structural diagram of Newark Basin (note — parts of basin margin not mapped as faults should be re as onlaps, faults with teeth on downthrown side): a, Jacksonwald Syncline; b, Chalfont Fault; c, Hopewell d, Flemington Fault; e, Sand Brook Syncline; f, Flemington Syncline; g, Cushetunk Mountain Anticline; h Germantown Syncline; i, Somerville Anticline; j, New Vernon Anticline; K, Ladentown Syncline; l, Watchun cline; m, Ramapo Fault.

C, Geographic map of Newark Basin showing locations of type sections of formations proposed in this a, type section of Passaic Formation; b, type section of Orange Mountain Basalt; c, type section of Feltville tion; d, type section of Preakness Basalt; e, type section of Towaco Formation in Roseland, New Jersey; section of Hook Mountain Basalt in Pine Brook, New Jersey; g, type section of Boonton Formation in Bo New Jersey; h, Lincoln Tunnel, Weehawken, New Jersey.

Data for A, B, and C from original observation and Kümmel, 1897, 1898; Lewis and Kümmel, 191 Darton, 1890, 1902; Darton *et al.*, 1908; Glaeser, 1963; Sanders, 1962; Van Houten, 1969; McLaughlin, 1943, 1944, 1945, 1946a, 1946b; Bascom *et al.*, 1909a, 1909b; Bailey *et al.*, 1914; Willard *et al.*, 1959; Mans pers. comm.

mation consists of a heterogenous mix of major units of differing and distinctive lithology, each as distinct and perhaps originally as widespread as the Stockton or Lockatong; further, each "Watchung Basalt" and the interbedded and overlying sedimentary beds are lithologically c from the lower Brunswick. In addition, C McDonald, and Traverse (1973), Corne Traverse (1975), Cornet (1977), and Olse Galton (1977) have shown that much

REFERENCE NO. 6

Elizabethtown Water Company

Netherwood Operations Center: 1341 North Avenue, Plainfield, NJ 07062 (908) 654-1234
Mailing Address: P.O. Box 111, Plainfield, NJ 07061-0001

October 5, 1993

Weston
Raritan Plaza I
4th Floor, Raritan Center
Edison, NJ 08837-3616

Dear Carolyn:

I am returning your maps with the Elizabethtown Water Company wells plotted within the designated area for your Site Investigation Prioritization located in Elizabeth, New Jersey.

Only the Hummocks Well Field is currently in service. The other wells are out of service because of water quality.

If I can be of any further assistance, kindly give me a call. My apologies for the lack of response in August.

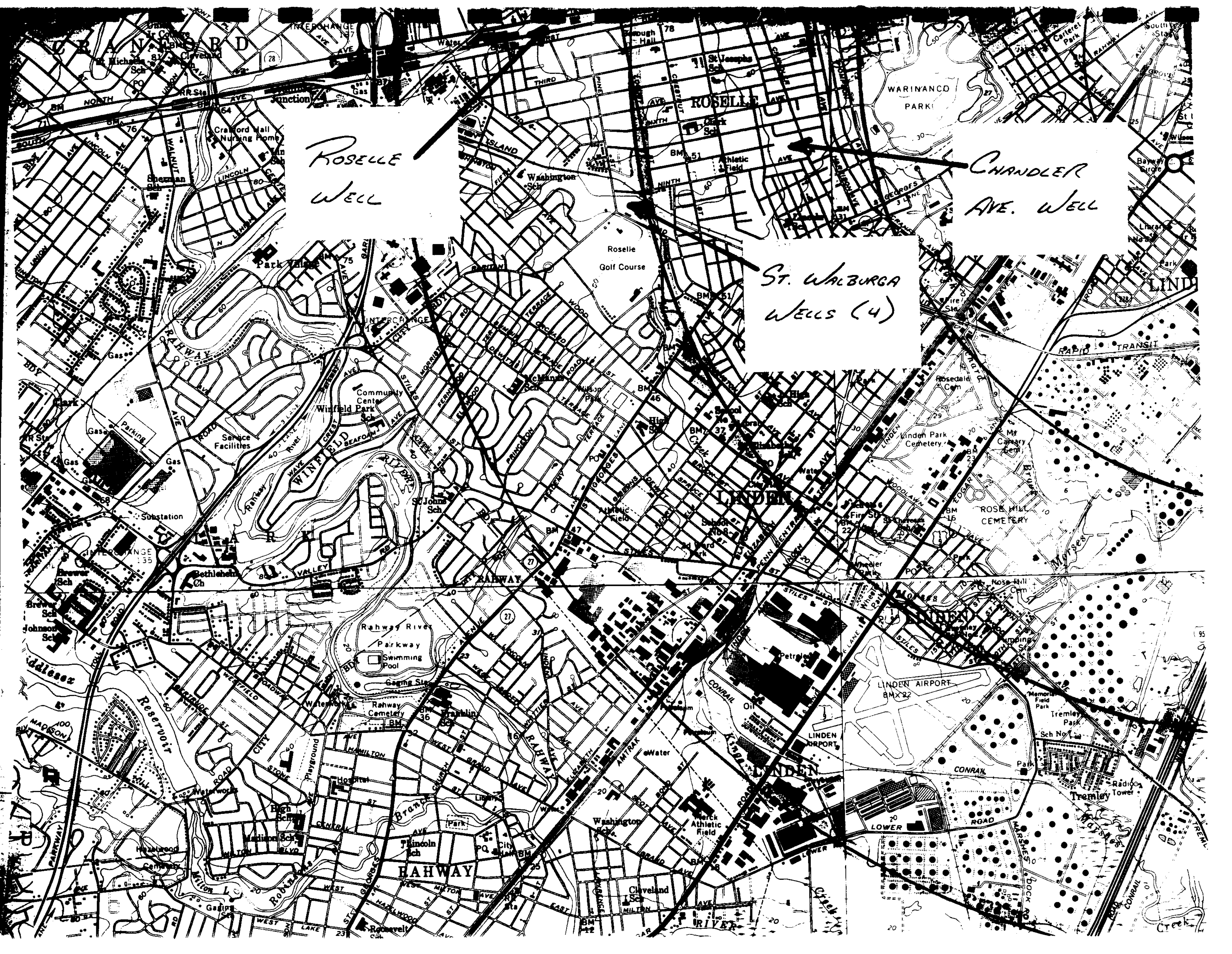
Very truly yours,

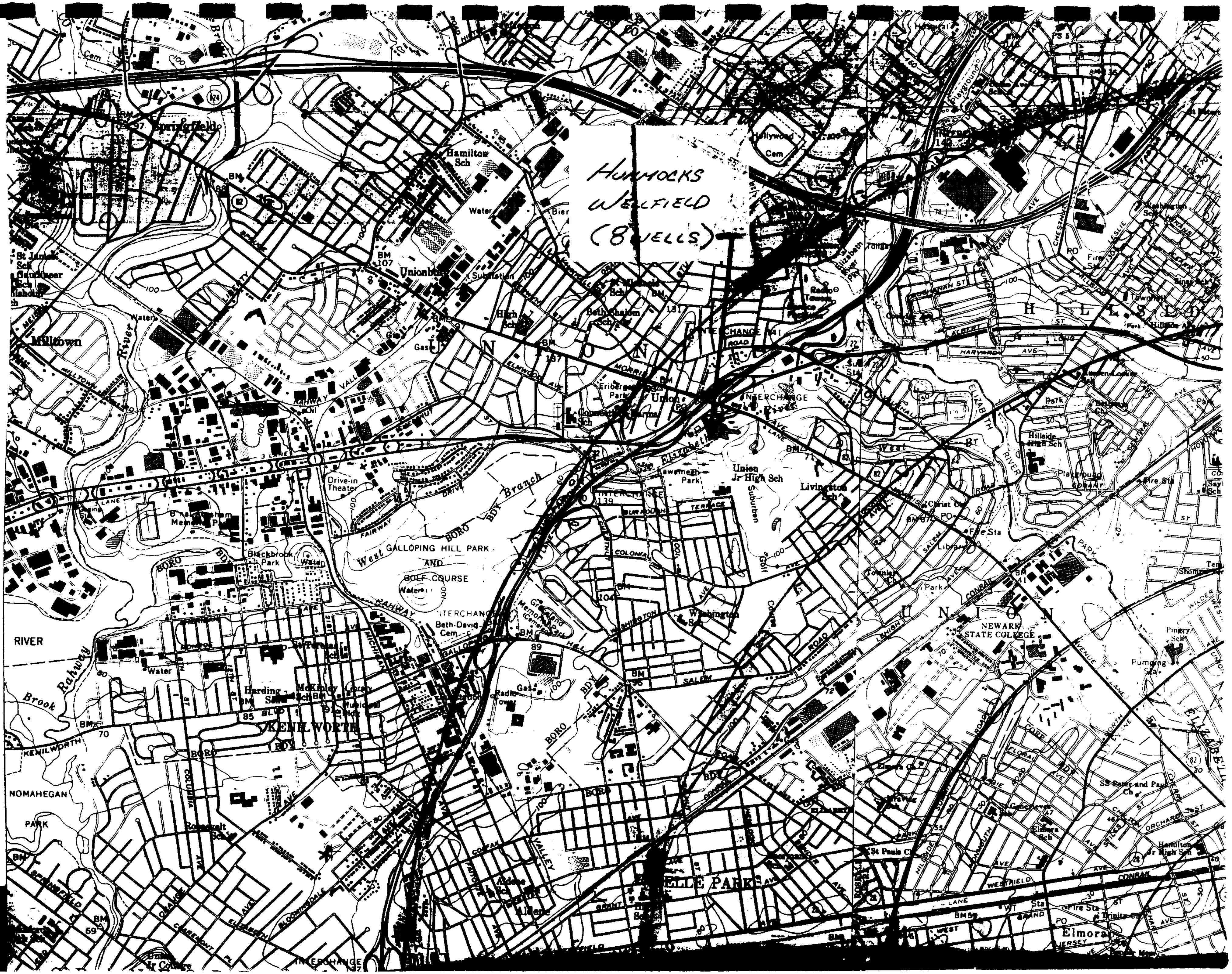
Richard A. Sadowski
Superintendent
Wells and Stations

RAS/jg
Enc.

PRALLS ISLAND REACH
NEW YORK CITY BDY
UNION CO
RICHMOND CO
GULFPORT REACH
Pralls Island
Pralls Creek
Grasselli
Bayway
Mattano Park
CONRAIL
NEW JERSEY
ARTHUR KILL
Gulfport
Old Place
Arlington Yards
Howland Hook
Port Ivory
Tidal Flat
Bloomfield
STATEN ISLAND
NORTH OF SHOOTERS ISLAND REACH
SOUTH OF SHOOTERS ISLAND REACH
NEW YORK
Shooters Island
Bulls Head
Graniteville
Mariners Harbor
Elm Park
Port Richmond
KILL VAN KULL
BAYONNE BRIDGE
BAYONNE
Willowbrook
WILLOWBROOK
BRYSON
Castleton Corners
BERGEN POINT WEST REACH
SOUTH REACH


NEWARK INTERNATIONAL
AIRPORT
Port
Newark
PORT NEWARK CHANNEL
ELIZABETH CHANNEL
NEW JERSEY TURNPIKE
EXTENSION
INTERCHANGE 14
Oak Island
Junction
Oak Island
Yards
Sewage Disposal
Garden
Yards
Tollgate
Parking
Radio
Towers
Weequahic Lake
Golf Course
EVERGREEN CEMETERY
ELIZABETH
Port
Newark
NORTH REACH
MIDDLE REACH
BAY
Veterans
Park
City Park
Pumping
Sta
ESSEX
UNION CO
HUDSON CO
MC LESTER
STREET
TERMINAL
TOLL ROAD
Service
Facilities
CONRAIL
DITCH
WILSON
AVE
TRANSIT
ST


ROSELLE WELL
CHANDLER AVE. WELL
ST. WALBURGA WELLS (4)
CRANFORD
ROSELLE
LINDEN
RAHWAY
WARINANCO PARK
Roselle Golf Course
Rahway River Parkway
Winfield Park
ROSE HILL CEMETERY
Linden Park Cemetery
Rahway Cemetery
LINDEN AIRPORT
Merck Athletic Field
Tremley
Reservoir
Middlesex


HUMMOCKS WELLFIELD (8 WELLS)
Springfield
Hamilton Sch
Union
Hollywood Cem
HILLSIDE
Milltown
UNION
Union Jr High Sch
Livingston Sch
Hillside High Sch
Drive-in Theater
West GALLOPING HILL PARK AND GOLF COURSE
Blackbrook Park
Beth-David Cem
Washington Sch
NEWARK STATE COLLEGE
RIVER
Rahway
Brook
KENILWORTH
Harding Sch
NOMAHEGAN
PARK
Roosevelt Sch
ROSELLE PARK
Elmora
INTERCHANGE
Kawameeh Park
Elizabeth River
Pingry Sch
Pumping Sta
Union Jr College
SS Peter and Paul Ch
St Pauls Ch
Alden Sch
Aldene
Westfield Ave

REFERENCE NO. 7

0012 T

WESTON

R. Fittino
Originator

Dup

PHONE CONVERSATION RECORD

Conversation with:
Name Rich Sadowski
Company Elizabethtown Water Company
Address _____
_____
Phone (908) 654-1234

Date 3/17/93
Time 1430 AM/PM

☒ Originator Placed Call
☐ Originator Received Call
W.O. NO. 4200-016-081-0004

Subject Public supply water system in Union

Notes: Well field in Union contains 8 wells from an overall system total of over 100 wells supplying the system. All water is blended prior to distribution and surface water is also blended in (85%/15% SW/GW). The entire system supplies 507,000 people. No other wells that are owned by the company are located within the 4 mile target distance limit.

☐ **File** _____
☐ **Tickle File** ____/____/____
☐ **Follow-Up By:** _____
☐ **Copy/Route To:** _____
_____

Follow-Up-Action: _____
_____
_____
_____

Originator's Initials RF

REFERENCE NO. 8

WESTON MANAGERS DESIGNERS CONSULTANTS

0049N

PROJECT NOTE

C J Serbe
Originator

TO: Elizabeth Coal Gas Site #2 & File DATE: 11/1/93

FROM: C. Serbe W.O. NO.: 04200-016-081-0051-C

SUBJECT: Population served by Hummocks well field

NOTES: According to phone conversation record, conversation between Rich Sadowski, Elizabethtown Water Co. and Rich Settimo, WESTON, a wellfield in Union (Hummocks well field) contains 8 wells from an overall system total of 100 wells. The water is blended (85%/15% surface water/groundwater) and the entire system supplies 507,000 people. Therefore, the population served by these 8 wells is calculated as follows:

507,000 total people ÷ 100 wells total = 5070 people/well × 8 wells of Hummocks well field = 40,560 people served by 8 wells (of which 15% served by groundwater) × .15 = 6084 people served by with groundwater from these 8 wells.

507,000 ÷ 100 × 8 × .15 = 6084 people

rr/RUDKO/PROJECTN.OTE

REFERENCE NO. 9

WESTON

Dave Benfer
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name DAN JANABS

Company NJDEP

Address Trenton

Phone 609-633-1179

Subject Well Head Protection

Date 11/16/92

Time 445 AM/PM

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO. 04220-016-081

Notes:

Although the Bureau of UST's has designated an area of 2000' from Municipal Water Supply wells, As of November 1992 there is NO designated Well Head Protection areas IN New Jersey.

☒ File Project File

☐ Tickle File ___/___/___

☐ Follow-Up By: ___

☐ Copy/Route To: ___

Follow-Up-Action: ___

Originator's Initials DB

FW 110-4-83

REFERENCE NO. 10

ELIZABETH COAL GAS SITE #2

ROAD CLASSIFICATION

Heavy-duty — Light-duty

Medium-duty — Unimproved dirt

Interstate Route — U.S. Route — State Route

SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

WESTON MANAGERS DESIGNERS/CONSULTANTS

FOUR MILE VICINITY MAP

SITE NAME:

ELIZABETH COAL GAS SITE #2

ELIZABETH, NEW JERSEY

DATE: 09/29/93

SCALE: 1"=2,000'

USGS QUAD: ELIZABETH, NJ-NY

REFERENCE NO. 11

NATIONAL WETLANDS INVENTORY
UNITED STATES DEPARTMENT OF THE INTERIOR

NATIONAL WETLANDS INVENTORY
UNITED STATES DEPARTMENT OF THE INTERIOR

SCALE 1:24000

Other information concerning the wetland resources depicted on this document may be available. For information, contact:

Regional Director (ARDE) Region V
U.S. Fish and Wildlife Service
1 Gateway Center, Suite 700
Newton Corner, Massachusetts 01258

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs biased on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deep-Water Habitats of the United States** (An Operational Draft), Cowardin, et al, 1977. The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a delailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

SYMBOLOGY EXAMPLE

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Dominance type (either vegetative or sedentary animal) can be added to the map by the interested user.
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.

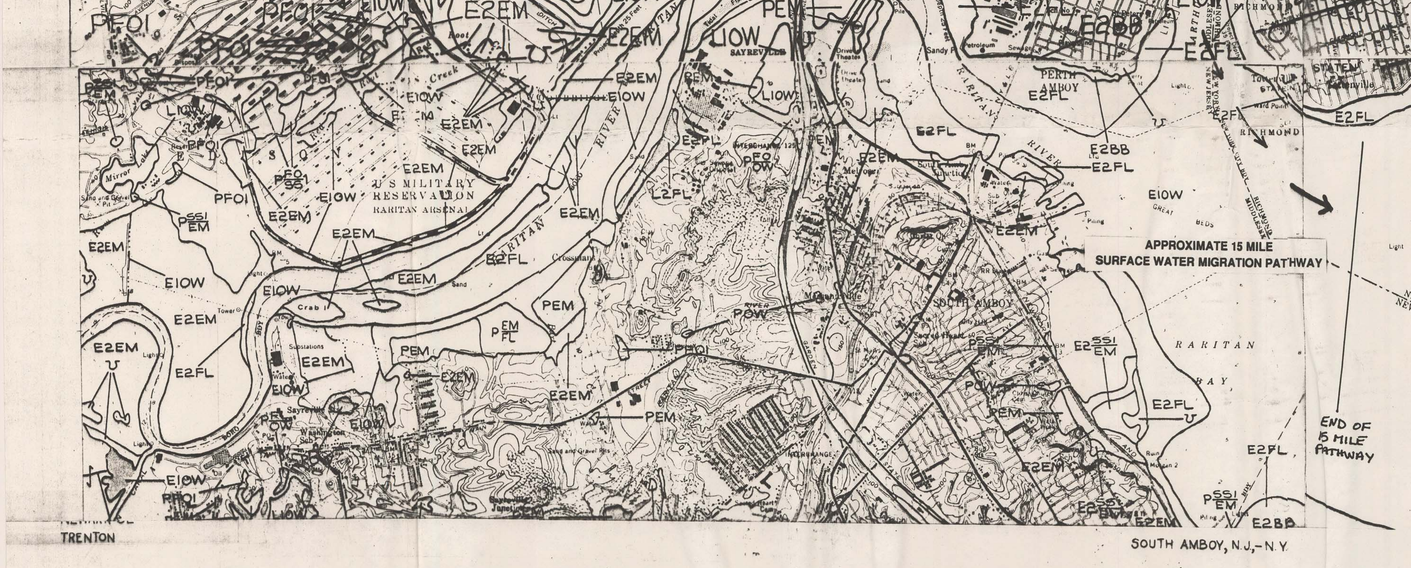
AERIAL PHOTOGRAPHY

DATE: 10/ /76
SCALE: 1:80000
TYPE: B-W
DATE: / /
SCALE:
TYPE:
DATE: / /
SCALE:
TYPE:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by Office of Biological Services for the National Wetlands Inventory

WETLAND LEGEND

U – Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.



MODIFYING TERMS

In order to more adequately describe wetland and aquatic habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system

WATER REGIME(1)	WATER CHEMISTRY	SOIL	SPECIAL MODIFIERS
Non Tidal: A Temporary; B Saturated; C Seasonal; D Seasonal Well-drained; E Seasonal Saturated; F Semipermanent; G Intermittently Exposed; H Permanent; J Intermittently Flooded-Permanent; K Intermittently Flooded-Temporary; L Saturated Intermittently Exposed Tidal: N Irregularly Flooded; P Regularly Flooded; R Irregularly Exposed; S Regularly Exposed; T Semipermanent Tidal; U Intermittent Tidal; V Permanent Tidal	Coastal Salinity: 1 Hypersaline; 2 Euhaline; 3 Mixohaline (Brackish); 4 Polyhaline; 5 Mesohaline Inland Salinity: 6 Hyperhaline; 7 Euhaline; 8 Mixohaline pH Modifiers for all Fresh Water: a Acid; b Circumneutral; c Alkaline	d Organic; e Mineral	f Beaver; g Partially Drained/Ditched; h Farmed; i Artificial; j Spoil; k Excavated

REFERENCE NO. 12

FAX COVER SHEET

0002R

Date: August 25, 1993

Time:

Number of Pages: 3
(Including cover sheet)

TO:

Mr./(Ms.) Carolyn

Of:

FAX #: 225-3240

FROM:

Mr./Ms. Nancy Stiepe

SPECIAL INSTRUCTIONS:

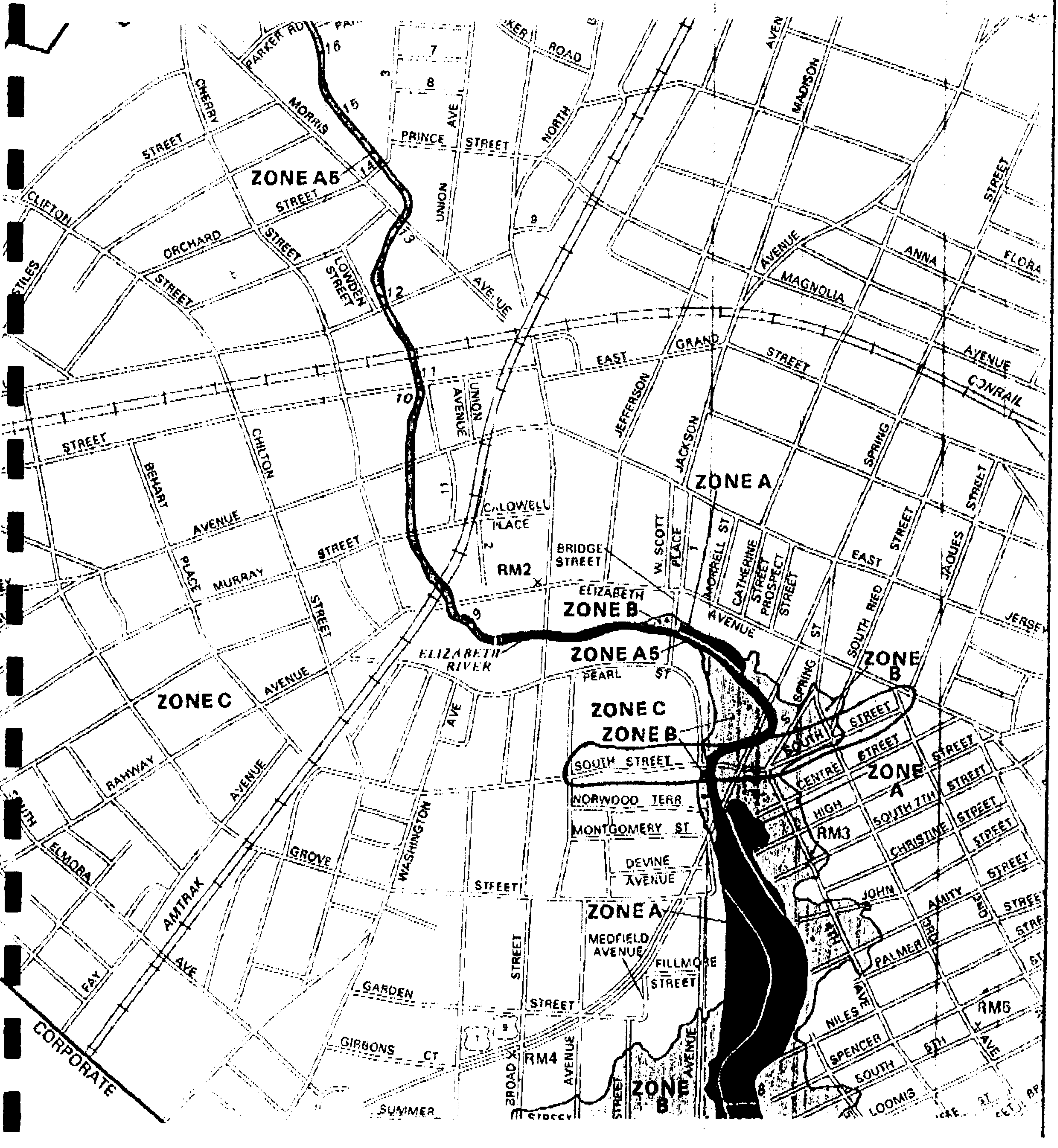
- ☐ Confidential
- ☐ Urgent
- ☐ Please reply
- ☒ For your information

COPY TO:

MESSAGE:

If you need further info.
please call me.
820-4270

CITY OF ELIZABETH
50 WINFIELD SCOTT PLAZA, ELIZABETH, N.J. 07201-2462
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING & ADMINISTRATION


ZONE A5
ZONE A
ZONE B
ZONE A5
ZONE C
ZONE C
ZONE B
ZONE B
ZONE A
ZONE A
ZONE B
RM2
RM3
RM4
RM6
PARKER RD
ROAD
CHERRY
MORRIS
STREET
PRINCE STREET
UNION AVE
NORTH
MADISON
CLIFTON
ORCHARD
STREET
LOWDEN STREET
AVENUE
ANNA
FLORA
MAGNOLIA
STILES
EAST GRAND STREET
AVENUE
CONRAIL
UNION AVENUE
JEFFERSON
JACKSON
SPRING
STREET
CHILTON
BEHART
AVENUE
STREET
MURRAY
PLACE
CALDWELL PLACE
BRIDGE STREET
W. SCOTT PLACE
MORRELL ST
CATHERINE STREET
PROSPECT STREET
EAST
STREET
JAQUES
SOUTH RIED
JERSEY
ELIZABETH AVENUE
ELIZABETH RIVER
PEARL ST
SPRING ST
SOUTH STREET
SOUTH STREET
CENTRE
STREET
AVENUE
RAHWAY
AVENUE
NORWOOD TERR
MONTGOMERY ST
HIGH
SOUTH 7TH
CHRISTINE
DEVINE AVENUE
GROVE
WASHINGTON
STREET
ELMORA
JOHN
AMITY
AMTRAK
MEDFIELD AVENUE
FILLMORE STREET
PALMER
AVE
FAY
GARDEN
STREET
STREET
NILES
SPENCER
SOUTH
6TH
GIBBONS CT
BROAD
AVENUE
CORPORATE
SUMMER
LOOMIS

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ELIZABETH, NEW JERSEY
UNION COUNTY

(ONLY PANEL PRINTED)

COMMUNITY-PANEL NUMBER
345523 0005 E

MAP REVISED:
NOVEMBER 1, 1985

Federal Emergency Management Agency

KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	
Zone Designations*	
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7x
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

INITIAL IDENTIFICATION

REFERENCE NO. 13

State of New Jersey
Department of Environmental Protection and Energy
Water Supply Element
CN 426
Trenton, NJ 08625-0426
Tel. # 609-292-7219
Fax. # 609-292-1654

Jeanne M. Fox
Acting Commissioner

Steven P. Nieswand, P.E.
Administrator

SEP 17 1993

SEPTEMBER 15, 1993

Weston
Raritan Plaza 1
4th Floor, Raritan Center
Edison, New Jersey 08837-3616

Att: Thomas A. Varner, Site Assessment Manager

Dear Mr. Varner:

Re: Surface Water Intakes

This is in regard to your letter of September 9, 1993 requesting information on surface water intakes within fifteen miles of two particular sites. You had further indicated that the intakes could be of a commercial, agricultural or potable nature. Please be advised that the Bureau of Safe Drinking Water (Bureau) regulates only Public Water Supplies as defined in the Safe Drinking Water Act. You may wish to contact the Bureau of Water Allocation at (609) 292-2957 for intakes other than those regulated by this Bureau.

commercial agricultural

Rather than perform an analysis of the intakes, I have attached for your use copies of this Bureau's inventory of potable water intakes and an accompanying list with latitudes and longitudes of the intakes as per the information available to us.

If you should have any questions on the attached information, please call me at (609) 292-5550.

Very Truly Yours,

John F. Fields
Supervising Environmental Engineer
Compliance Section

attach

c Thomas McCarthy

SURFACE WATER INTAKES - PUBLIC SUPPLY

CNTY MUNICIPALITY	PURVEYOR	SOURCE	ID	LONG/LAT	
	US ARMY FT DIX	RANCOCAS CRK.	0325001	74 37 47.10	39 57 36.08
ATLANTIC CITY	ATLANTIC CITY WATER DEPT.	DOUGHTY RESERVOIR	0102001	74 31 21.06	39 25 48.75
NEW MILFORD	HACKENSACK WATER CO.	ORADELL RESERVOIR	0238001	74 1 28.55	40 57 28.44
NEW MILFORD	HACKENSACK WATER CO.	HACKENSACK RIVER	0238001	74 1 36.64	40 56 47.63
CITY OF BURLINGTON	BURLINGTON CITY WATER DEPT.	DELAWARE RIVER (EXISTING)	0305001	74 50 21.82	40 5 19.78
CITY OF BURLINGTON	BURLINGTON CITY WATER DEPT.	DELAWARE RIVER (FUTURE)	0305001	74 50 36.07	40 5 14.45
CALDWELL TOWNSHIP	N.J.D.W.S.C.	POMPTON RIVER	1613001	74 16 22.79	40 53 58.59
CITY OF ORANGE	CITY OF ORANGE WATER DEPT.	W. BRANCH RAHWAY RIVER	0717001	74 17 19.48	40 45 33.65
MILLBURN TOWNSHIP	COMMONWEALTH WATER DEPT.	PASSAIC RIVER	0712001	74 21 56.16	40 44 42.88
MILLBURN TOWNSHIP	COMMONWEALTH WATER DEPT.	CANOE BROOK	0712001	74 21 13.31	40 44 40.77
NEWARK	NEWARK	PEQUANNOCK WATER SHED	0714001	74 25 27.07	41 1 32.44
GREENWICH TOWNSHIP	DUPONT-REPAUNO PNT-GBBSTWN	DELAWARE RIVER		75 18 23.02	39 50 34.97
JERSEY CITY	JERSEY CITY DIV. OF WATER	BOONTON RESERVOIR	0906001	74 23 51.41	40 53 33.80
BLOOMSBURY	BOROUGH OF BLOOMSBURY	PINE HOLLOW (*)	1003001	75 4 42.46	40 38 48.50
CITY OF LAMBERTVILLE	LAMBERTVILLE WATER CO.	SWAN CREEK RES. EAST	1017001	74 55 28.18	40 21 40.52
CITY OF LAMBERTVILLE	LAMBERTVILLE WATER CO.	SWAN CREEK RES. WEST	1017001	74 55 43.90	40 21 46.63
CITY OF LAMBERTVILLE	LAMBERTVILLE WATER CO.	DELA.-RAR. CANAL (*)	1214001	74 56 46.94	40 21 55.90
TRENTON	CITY OF TRENTON	DELAWARE RIVER	1111001	74 46 45.57	40 13 19.06
CITY OF PERTH AMBOY	PERTH AMBOY WATER DEPT.	TENNENTS CK. (RECHARGE)	1216001	74 20 12.23	40 25 33.99
EDISON TOWNSHIP	MIDDLESEX WATER CO.	RARITAN RIVER	1225001	74 26 32.12	40 30 2.46
NEW BRUNSWICK	NEW BRUNSWICK WATER DEPT.	LAWRENCE BROOK	1214001	74 24 45.97	40 28 58.48
NO. BRUNSWICK TWP.	TWP. OF NO. BRUNSWICK	DELA.-RAR. CANAL	1214001	74 34 59.03	40 27 38.49
SAYREVILLE	SAYREVILLE WATER DEPT.	SOUTH RIVER (RECHARGE)	1219001	74 21 41.75	40 24 58.99
WOODBRIDGE	MIDDLESEX WATER CO.	DELA.-RAR. CANAL	1225001	74 27 34.00	40 30 25.66
HOWELL TWP.	N.J. WATER SUPP. AUTH.	MANASQUAN RIV. (PROPOSED)	1352005	74 11 27.43	40 10 31.82
HOWELL TWP.	N.J. WATER SUPP. AUTH.	MANASQUAN RIV. (PROPOSED)	1352005	74 7 18.84	40 8 44.98
LONG BRANCH	MONMOUTH CONSOLID. WAT. CO.	SHARK RIVER	1345001	74 4 16.51	40 11 53.69
LONG BRANCH	MONMOUTH CONSOLID. WAT. CO.	JUMPING BROOK	1345001	74 3 57.82	40 12 11.83
MANALAPAN TWP.	MATCHAPONIX WAT. SUPP. CO.	MATCHAPONIX BROOK	1326004	74 21 50.42	40 18 33.20
SHREWSBURY	MONMOUTH CONSOLID. WAT. CO.	SWIMMING RIVER RES.	1345001	74 7 13.35	40 19 6.70
WALL TOWNSHIP	MONMOUTH CONSOLID. WAT. CO.	MANASQUAN RIV. GLENDOLA RES.	1345001	74 6 45.13	40 11 42.47
BORO. OF MENDHAM	MENDHAM WATER DEPT.	INDIA BK. RESERVOIR (*)	[illegible]	74 36 33.68	40 48 40.05
BUTLER	BUTLER WATER DEPT.	KAKEOUT RESERVOIR	[illegible]	74 21 58.63	40 59 24.13
JEFFERSON TWP.	JEFFERSON TWP. M.U.A. (WINONA)	LAKE HOPATCONG-NOLAN'S PT.	[illegible]	74 36 24.28	40 59 20.98
JEFFERSON TWP.	JEFFERSON TWP. M.U.A.	LAKE SHAWNEE (*)	1414011	74 35 50.64	40 58 12.04
TOWN OF BOONTON	TOWN OF BOONTON	TAYLORTOWN RESERVOIR	1401001	74 23 0.06	40 57 13.06
TOWN OF MORRISTOWN	SOUTHEAST MORRIS COUNTY	CLYDE POTTS RESERVOIR	142001	74 34 51.90	40 48 21.61
BRICK TOWNSHIP	BRICK TWP. M.U.A.	METEDECONK RIVER	[illegible]	74 [illegible] 36.45	40 4 28.07
BOROUGH OF HALEDON	HALEDON WATER DEPT.	MOLLY ANN'S BR. RES.	1603001	74 [illegible] 44.73	40 58 44.13
LITTLE FALLS	PASSAIC VALLEY WATER	PASSAIC RIVER (TOTOWA)	1605002	74 13 51.49	40 52 58.46
POMPTON LAKES	N. J. D. W. S. C.	RAMAPO RIVER	1613001	74 16 54.91	40 58 17.93
WANAQUE BOROUGH	N. J. D. W. S. C.	RAMAPO RIVER	1613001	74 16 44.68	40 59 33.45
WANAQUE BOROUGH	N. J. D. W. S. C.	WANAQUE RESER.	1613001	74 17 39.54	41 2 47.67
CITY OF SALEM	SALEM WATER DEPARTMENT	LAUREL LAKE	1712001	75 24 28.33	39 32 52.62
PENNSVILLE TWP.	E.I. DUPONT DENEMOURS & CO.	SALEM CANAL (NON-COMM.)	000000	75 30 19.63	39 41 8.91
BRANCHVILLE BOROUGH	BRANCHVILLE WATER DEPT.	DRY BROOK RESERVOIR	1903001	74 43 58.35	41 11 43.58
FRANKLIN BOROUGH	FRANKLIN WATER COMMISSION	WALLKILL R. (FRANKLIN PND.)	1906002	74 35 20.05	41 6 41.79
FRANKLIN BOROUGH	FRANKLIN WATER COMMISSION	WALLKILL R. (FRANKLIN PND.)	1096002	74 34 17.07	41 8 14.40
NEWTON	NEWTON WATER DEPARTMENT	LAKE MORRIS	1915001	74 36 24.58	41 2 31.05
SUSSEX	SUSSEX WATER DEPARTMENT	LAKE RUTHERFORD	1920001	74 39 [illegible]	41 16 36.29
VERNON TOWNSHIP	[illegible] CLUB (SUMMER)	LAKE [illegible]	1922017	74 32 [illegible]	41 14 17.41
VERNON TOWNSHIP	HIGHLAND LKS IMPROV. (SUMMER)	RESERVOIR [illegible] POCHUCK CK.	1922017	74 28 13.28	41 11 10.71

SURFACE WATER INTAKES - PUBLIC SUPPLY

	MUNICIPALITY	SURVEYOR	SOURCE	ID	LONG/LAT					
UNI	CITY OF RAHWAH	RAHWAY WATER DEPARTMENT	RAHWAY RIVER	2013001	74	17	26.57	40	37	6.41
	ELIZABETH	ELIZABETHTOWN WATER CO.	RARITAN RIVER	2004002	74	34	6.28	40	32	45.58
	ELIZABETH	ELIZABETHTOWN WATER CO.	MILLSTONE RIVER	2004002	74	34	10.91	40	32	31.02
	ELIZABETH	ELIZABETHTOWN WATER CO.	CONFL. OF RAR. & MILL. RVRS.	2004002	74	34	1.82	40	33	33.33
	HACKETTSTOWN	HACKETTSTOWN M. U. A.	LOWER MINE HILL RESERVOIR	2108001	74	47	41.62	40	51	23.77
	HACKETTSTOWN	HACKETTSTOWN M. U. A.	BURD RESERVOIR	2108001	74	48	1.64	40	50	27.91
	TOWN OF BELVIDERE	BUCKHORN SPRINGS WATER CO.	IMPOUND. RES. ON BUCKHORN CK.	2103001	75	4	20.99	40	47	58.03
	WASHINGTON	NEW JERSEY WATER CO.	ROARING ROCK CK. RES. (*)	2102001	75	1	48.22	40	45	55.70

SURFACE WATER INTAKE LOCATIONS
BUREAU OF SAFE DRINKING WATER

Prepared by: Michael Mariano

CENTRAL

TRENTON
BURL CITY
NEW BRUNS
N. BRUNS
NWWC

SAYREVILLE
BRICK
[illegible]
[illegible]
[illegible]
MATAW
E TOWN

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
0102001	ATLANTIC CITY WATER DEPARTMENT	609-345-3315	ABSECON	DOUGHTY POND - South tip - Mays Landing Rd. & Mill Rd.
0238001	HACKENSACK WATER DEPARTMENT	201-767-9300	PARAMUS	SADDLE RIVER - South of intersection of Paramus Rd. & Midland Ave.
			ORADELL	HACKENSACK RIVER - At Martin Ave.
			NORTHVALE	SPARK HILL CREEK - Northwest of intersection of Pegasus Ave. & Hill Terr.
			ORADELL	LONG SWAMP BROOK - At Martin Ave.
0305001	BURLINGTON CITY WATER DEPARTMENT	609-386-0307	EAST BURLINGTON	DELAWARE RIVER - 1/4 mile north of Assiscunk Creek
			BURLINGTON ISLAND	BURLINGTON ISLAND LAKE
0325001	FORT DIX	609-562-5040		RANCOCAS CREEK
1613001	NJDWSC	201-575-0225	POMPTON LAKES	RAMAPO RIVER - At Pompton Lake (pump to Wanaque Res.)
			WANAQUE	WANAQUE RESERVOIR - Ringwood Ave & Oricchio Ave
0717001	CITY OF ORANGE	201-762-6000	SOUTH ORANGE	ORANGE RESERVOIR - On West branch of Rahway River 40 ft upstream from dam

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
0712001	NJ AMERICAN NORTHERN DISTRICT	201-376-8800	MILLBURN	PASSAIC RIVER - At Kennedy Parkway
			SHORT HILLS	CANOE BROOK - North of Route 24
			CALDWELL	POMPTON RIVER - At Bridges Rd.
0714001	NEWARK WATER DEPT	201-256-4965		PEQUANNOCK WATER SHED
0906001	JERSEY CITY WATER DEPARTMENT	201-547-4390	BOONTON	BOONTON RESERVOIR - 200 yds northwest of Washington St Bridge
			ROCKAWAY	SPLIT ROCK RESERVOIR - Empties into Boonton Res. via Rockaway River
1017001	LAMBERTVILLE WATER DEPARTMENT	609-397-0526	LAMBERTVILLE	SWAN CREEK RESERVOIR EAST
			LAMBERTVILLE	SWAN CREEK RESERVOIR WEST
			LAMBERTVILLE	DELAWARE-RARITAN CANAL - At Swan St. (Emergency)
1111001	CITY OF TRENTON	609-989-3208	TRENTON	DELAWARE RIVER - At Rt 29 north of Calhoun St. Bridge
1216001	PERTH AMBOY	908-826-0290	OLD BRIDGE	TENNENTS POND - At Waterworks Rd.
1225001	MIDDLESEX WATER CO	908-634-1500	EDISON	DELAWARE-RARITAN CANAL & MILLSTONE RIVER - At Rt 18

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
1214001	NEW BRUNSWICK WATER DEPARTMENT	908-745-5060	NEW BRUNSWICK	LAWRENCE BROOK - At Burnet St St.
			NEW BRUNSWICK	DELAWARE-RARITAN CANAL - At George St & College Ave
1214001	NORTH BRUNSWICK	908-247-0922	FRANKLIN TWP	DELAWARE-RARITAN CANAL - At Suydan Ave.
1219001	SAYERVILLE	908-390-7000	OLD BRIDGE	SOUTH RIVER - At Main St North of Rt 18
1352005	NEW JERSEY WATER SUPPLY AUTH.		WALL TWP	MANASQUAN RIVER - Hospital Rd. North of Garden State Parkway (Pump to Manasquan Resevior)
1345001	NJ AMERICAN - MONMOUTH		WALL TWP	MANASQUAN RIVER - Hospital Rd. North of GSP (Pump to Glendola Reservoir)
			NEPTUNE TWP	SHARK RIVER - Off Corlies Ave. 2000' North of GSP
			NEPTUNE TWP	JUMPING BROOK - At Greensgrove & Corlies Aves
			LINCROFT	SWIMMING RIVER RESERVOIR - 1000' West of Swimming Riv.
1326004	MATCHAPONIX		MANALAPAN	MATCHAPONIX BROOK - At Wilson Ave.
1401001	TOWN OF BOONTON	201-299-7740	MONTVILLE	TAYLORTOWN RESERVOIR - At Taylortown Rd.

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
1403001	BUTLER WATER DEPT	201-838-7200	BUTLER	KIKEOUT RESERVOIR - At Resevior Rd.
1424001	SOUTH EAST MORRIS COUNTY	201-538-5600	MENDHAM	CLYDE POTTS RESERVOIR - Cold Hill Rd & Woodland Rd
1506001	BRICK TWP	908-458-7000		METEDECONK RIVER
1603001	HALEDON WATER DEPT		HALEDON	HALEDON RESERVOIR - Lower Basin pump station at Belmont Ave.
1605002	PASSAIC VALLEY WATER COMMISSION	201-256-1566	WAYNE	POMPTON RIVER - At Confluence of Ramapo & Pequannock Rivers
			TOTOWA	PASSAIC RIVER - At Union Blvd.
1708300	E.I. DUPONT PENNSVILLE	609-299-5000		SALEM CANAL
1712001	SALEM WATER DEPT	609-935-0350	CLINTON TWP	LAUREL LAKE - At Waterworks Rd & Lake Ave.
			ALLOWAY TWP	ELKINTON MILL POND - Waterworks Rd. 3 miles east of Laurel Lake (Seasonal)
1903001	BRANCHVILLE WATER DEPARTMENT	201-948-6463	FRANKFORD TWP	BRANCHVILLE RESERVOIR - 7300' norhteast of Mattison Ave & Mattison School Rd.
1906002	FRANKLIN WATER DEPT	201-827-7060	FRANKLIN BOROUGH	FRANKLIN POND - Franklin Ave. Across from plant
1915001	NEWTON WATER DEPT	201-383-3521	SPARTA TWP	MORRIS LAKE

STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
MARCH 1992

PWSID#	PURVEYOR NAME	PHONE NUMBER	INTAKE MUNICIPALITY	INTAKE LOCATION
1921001	SUSSEX WATER DEPT	201-967-5622	WANTAGE TWP	COLESVILLE RESERVOIR - At Brink Rd. 400' west of Rt. 23
2013001	RAHWAY WATER DEPT	201-388-0086	RAHWAY	RAHWAY RIVER - At pump station off Valley Rd & Lambert St.
2004002	ELIZABETHTOWN WATER COMPANY	201-345-4444	BRIDGEWATER TWP	RARITAN & MILLSTONE RIVERS - At confluence
2108001	HACKETTSTOWN MUA	201-852-3622	DRAKESTOWN	MINE HILL RESERVOIR - Off Mine Hill Rd.
			DRAKESTOWN	BURD RESERVOIR - Off Reservoir Rd. Southeast of

REFERENCE NO. 14

0021 T

WESTON

T. Vainey
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name: Bob Soldwedel

Company: Chief, Bureau of Freshwater Fisheries (NJDEPE)

Address:

Phone: (609) 292-8642

Date: 05 / 24 / 93

Time: 15:40 AM/(PM)

☒ Originator Placed Call

☐ Originator Received Call

W.O. NO.: 04200-016-081-0002

Subject: Fishing in Newark Bay Complex

Notes: Mr. Soldwedel told me that, despite certain restrictions people do fish in and keep fish from the Passaic River, Newark Bay, Arthur Kill, Kill Van Kull, and the Narrows area. He said that people fish anywhere there's a shoreline along these water bodies. He also said there was something on television showing people fishing in part of these waters.

☒ **File** Int'l Metallurgical Services

☐ **Tickle File** ____ / ____ / ____

☐ **Follow-Up By:**

☐ **Copy/Route To:**

Follow-Up-Action:

Originator's Initials TAV

RFW 110-4-83

REFERENCE NO. 15

0023T

WESTON

Carolyn J. Serbe
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name Bob Soldwedel
Company Bureau of Freshwater Fisheries
Address _____
_____
Phone 609/292-8642

Date 9 / 2 / 93
Time 950 (AM)/PM

☑ Originator Placed Call
☐ Originator Received Call

W.O. NO. 04200-016-081-0062

Subject Fishing in Elizabeth River

Notes: Mr. Soldwedel informed me that people fish everywhere in NJ including Elizabeth River. The type of fish people will most likely catch are carp and sunfish.

☑ **File** Elizabeth Coal Gas Site # 2
☐ **Tickle File** ____/____/____
☐ **Follow-Up By:** _____
☐ **Copy/Route To:** _____

Follow-Up-Action: _____

Originator's Initials CJS

RFW 110-4-83

REFERENCE NO. 16

State of New Jersey
Department of Environmental Protection and Energy
Division of Parks and Forestry
Office of Natural Lands Management
CN 404
Trenton, NJ 08625-0404
Tel. # 609-984-1339
Fax. # 609-984-1427

Jeanne M. Fox
Acting Commissioner

Thomas F. Hampton
Administrator

September 24, 1993

Richard Settino
Roy F. Weston, Inc.
Raritan Plaza One, 4th Floor
Edison, NJ 08837

Re: Elizabeth Coal Gas #2 and Associated Waterways
(Work Order No. 4200-016-081-0062-02)

Dear Mr. Settino:

Thank you for your data request regarding rare species information for the above referenced project site in Middlesex and Union Counties.

The Natural Heritage Data Base does not have any records for rare plants, animals, or natural communities on or within one half mile of the Elizabeth Coal Gas #2 site. However, there is a record for a rare species occurrence which may be on, or in the immediate vicinity of the waterways that you have associated with this site. The attached list provides additional information about this occurrence. Also attached is a list of rare species from records in the general vicinity of the project site (within approximately 4 miles).

Also attached are lists of rare vertebrates of Middlesex and Union Counties together with descriptions of their habitats. If suitable habitat is present at the project site, these species would have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish, Game and Wildlife Endangered and Nongame Species Program.

In order to red flag the general locations of documented occurrences of rare and endangered species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Arthur Kill, Elizabeth, Keyport, Perth Amboy, and South Amboy USGS quadrangles.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice

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details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Thomas F. Breden
Coordinator/Ecologist
Natural Heritage Program

cc: Lawrence Niles
Thomas Hampton
NHP File No. 93-4007462

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEPE Land Use Regulation Program, CN 401, Trenton, NJ 08625-0401.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

24 SEP 1993

ON OR IN THE IMMEDIATE VICINITY OF ASSOCIATED WATERWAYS
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E		G3	S1	1984-09-30	Y

1 Records Processed

24 SEP 1993

GENERAL VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2	1940-??-??	
STERNA ANTILLARUM	LEAST TERN		E		G4	S2	1976-SUMMR	Y
*** Invertebrates								
ALASMIDONTA UNDULATA	TRIANGLE FLOATER				G5	S3S4	????-??-??	Y
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	LE	E		G1	SH	????-??-??	Y
*** Other types								
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3	1986-06-??	Y
*** Vascular plants								
LEMNA PERPUSILLA	MINUTE DUCKWEED				G5	S1	1869-08-??	Y

6 Records Processed

5\18\87

NEW JERSEY NATURAL HERITAGE PROGRAM
POTENTIAL THREATENED AND ENDANGERED VERTEBRATE SPECIES
IN MIDDLESEX COUNTY

AMERICAN BITTERN BOTAURUS LENTIGINOSUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Fresh water bogs, swamps, wet fields, cattail and bulrush marshes, brackish and saltwater marshes and meadows.

BARRED OWL STRIX VARIA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Dense woodland and forest (conif. or hardwood), swamps, wooded river valleys, cabbage palm-live oak hammocks, especially where bordering streams, marshes, and meadows.

BOBOLINK DOLICHONYX ORYZIVORUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Tall grass areas, flooded meadows, prairie, deep cultivated grains, alfalfa and clover fields. In migration and winter also in rice fields, marshes, and open woody areas.

BOG TURTLE CLEMMYS MUHLENBERGII	FEDERAL STATUS: C2 STATE STATUS: LE	COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Slow, shallow rivulets of sphagnum bogs, swamps, and marshy meadows; sea level to 1200 m in Appalachians. Commonly basks on tussocks in morning in spring and early summer. Hibernates in subterreanean rivulet or seepage area.

COOPER'S HAWK ACCIPITER COOPERII	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Primarily mature forest, either broadleaf or coniferous, mostly the former; also open woodland and forest edge.

GREAT BLUE HERON ARDEA HERODIAS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: N*

HABITAT COMMENTS
Freshwater and brackish marshes, along lakes, rivers, bays, lagoons, ocean beaches, mangroves, fields, and meadows.

5\18\87

SAVANNAH SPARROW PASSERCULUS SANDWICHENSIS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: W*

HABITAT COMMENTS
"Open areas, especially grasslands, tundra, meadows, bogs, farmlands, grassy areas with scattered bushes, and marshes, including salt marshes in the BELDINGI and ROSTRATUS groups (Subtropical and Temperate zones)".

SHORT-EARED OWL ASIO FLAMMEUS	FEDERAL STATUS: STATE STATUS: LE/S	COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Open country, including prairie, meadows, tundra, moorlands, marshes, savanna, dunes, fields, and open woodland. Roosts by day on ground or on low open perches.

UPLAND SANDPIPER BARTRAMIA LONGICAUDA	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Grasslands, especially prairies, dry meadows, pastures, and (in Alaska) scattered woodlands at timberline; very rarely in migration along shores and mudflats.

WOOD TURTLE CLEMMYS INSCULPTA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Vicinity of streams and rivers. In streams and in wooded areas and fields adjacent to streams in summer. In streams in spring and fall. Hibernates in banks or bottoms of streams in winter.

6/9/87

NEW JERSEY NATURAL HERITAGE PROGRAM
POTENTIAL THREATENED AND ENDANGERED VERTEBRATE SPECIES
OF UNION COUNTY

AMERICAN BITTERN BOTAURUS LENTIGINOSUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Fresh water bogs, swamps, wet fields, cattail and bulrush marshes, brackish and saltwater marshes and meadows.

BARRED OWL STRIX VARIA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Dense woodland and forest (conif. or hardwood), swamps, wooded river valleys, cabbage palm-live oak hammocks, especially where bordering streams, marshes, and meadows.

BOG TURTLE CLEMMYS MUHLENBERGII	FEDERAL STATUS: C2 STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Slow, shallow rivulets of sphagnum bogs, swamps, and marshy meadows; sea level to 1200 m in Appalachians. Commonly basks on tussocks in morning in spring and early summer. Hibernates in subterreanean rivulet or seepage area.

COOPER'S HAWK ACCIPITER COOPERII	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Primarily mature forest, either broadleaf or coniferous, mostly the former; also open woodland and forest edge.

GREAT BLUE HERON ARDEA HERODIAS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: N*

HABITAT COMMENTS
Freshwater and brackish marshes, along lakes, rivers, bays, lagoons, ocean beaches, mangroves, fields, and meadows.

LONGTAIL SALAMANDER EURYCEA LONGICAUDA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Streamsides, spring runs, cave mouths, forested floodplains in South. May disperse into wooded terrestrial habitats in wet weather. Hides under rocks, logs, and other debris.

6/9/87

YELLOW-CROWNED NIGHT-HERON	FEDERAL STATUS:	COUNTY
NYCTICORAX VIOLACEUS	STATE STATUS: LT	OCCURRENCE: ?

HABITAT COMMENTS
Marshes, swamps, lakes, lagoons, and mangroves.

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 55, No. 35; F.R. 50 CFR 17.11 and 17.12). Federal Status codes reported for species follow the most recent listing.

LE Taxa formally listed as endangered.

LT Taxa formally listed as threatened.

PE Taxa already proposed to be formally listed as endangered.

PT Taxa already proposed to be formally listed as threatened.

C1 Taxa for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.

C1* Taxa which may be possibly extinct (although persuasive documentation of extinction has not been made--compare to 3A status).

C2 Taxa for which information now in possession of the Service indicates that proposing to list them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support the immediate preparation of rules.

C3 Taxa that are no longer being considered for listing as threatened or endangered species. Such taxa are further coded to indicate three subcategories, depending on the reason(s) for removal from consideration.

3A Taxa for which the Service has persuasive evidence of extinction.

3B Names that, on the basis of current taxonomic understanding, do not represent taxa meeting the Act's definition of "species".

3C Taxa that have proven to be more abundant or widespread than was previously believed

S Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.

U Undetermined species-a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy has developed a ranking system for use in identifying elements (rare species and natural communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.

S3 Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 Apparently secure in state, with many occurrences.

S5 Demonstrably secure in state and essentially ineradicable under present conditions.

SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include european strays or western birds on the East Coast and visa-versa.

SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.

.1 Elements documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

Y Identification has been verified and is indicative of significant habitat.

BLANK Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.

? Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

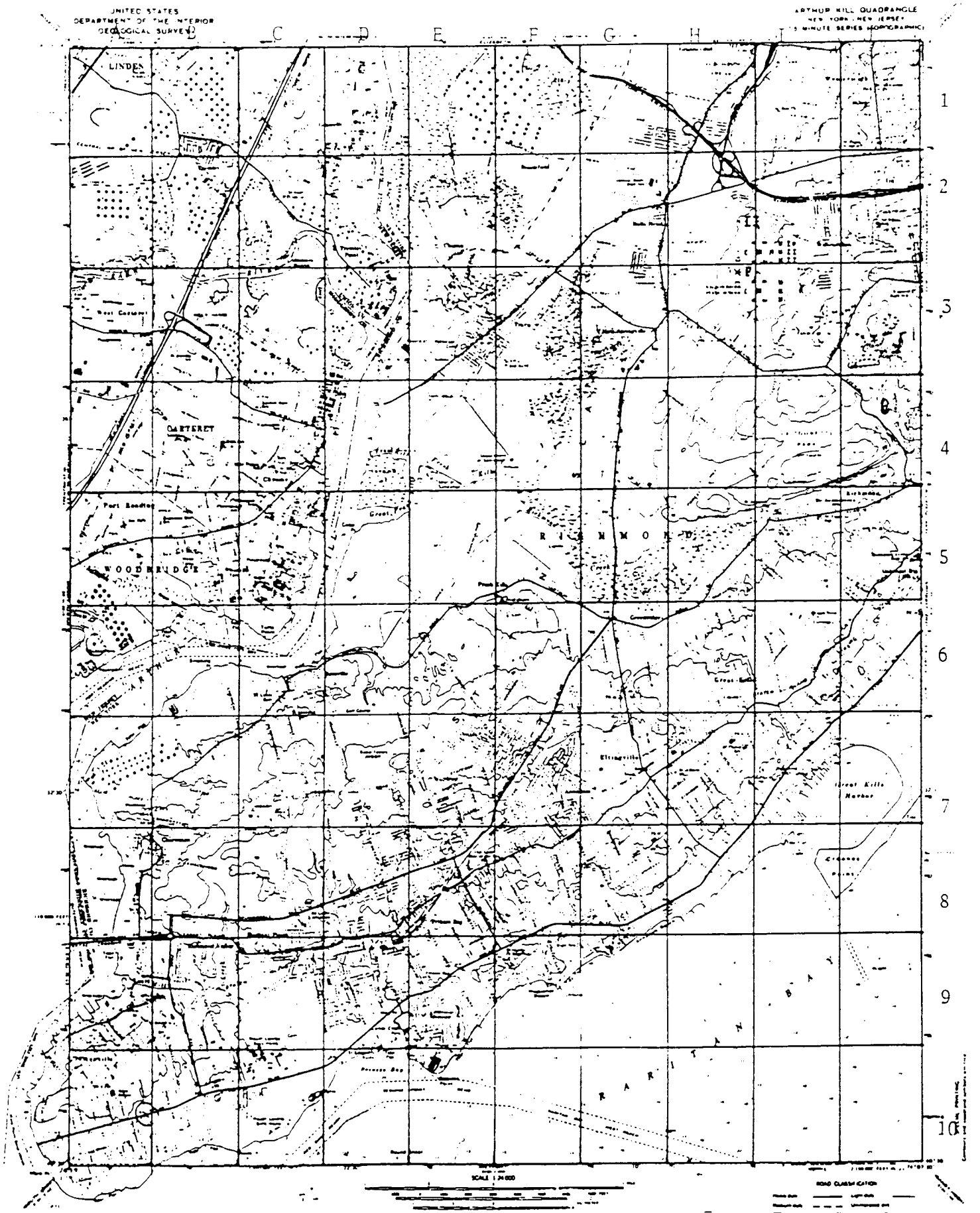
Revised September 1991

NATURAL LANDS MANAGEMENT

NATURAL HERITAGE INDEX MAPS

The Natural Heritage Database contains several thousand records of individual occurrences of endangered and threatened species and ecosystems. Many of these occurrences either have not been documented in recent years or have not had habitat boundaries delineated. Because much work remains to be done to delineate habitat boundaries and determine current status for these occurrences, Natural Heritage Index Maps were devised to red flag general areas in which the occurrences are located. The index maps are meant to be used as a tool to point to areas which may be of significance for endangered biological diversity. These maps do not depict all endangered species habitat in the State, but merely general areas which contain documented occurrences. Many additional areas may contain unidentified or poorly documented occurrences.

The maps have been produced using a computer generated grid which shades a grid cell approximately 330 acres in size if an endangered or threatened species or ecosystem has been documented anywhere within the cell. To use these maps, we suggest that you first find the location to be checked on the quad maps and then refer to the same grid location of the Natural Heritage Index Maps. The Natural Heritage Program can be contacted for additional information as specific projects are planned.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ARTHUR KILL QUADRANGLE
NEW YORK - NEW JERSEY
7.5 MINUTE SERIES (TOPOGRAPHIC)
A
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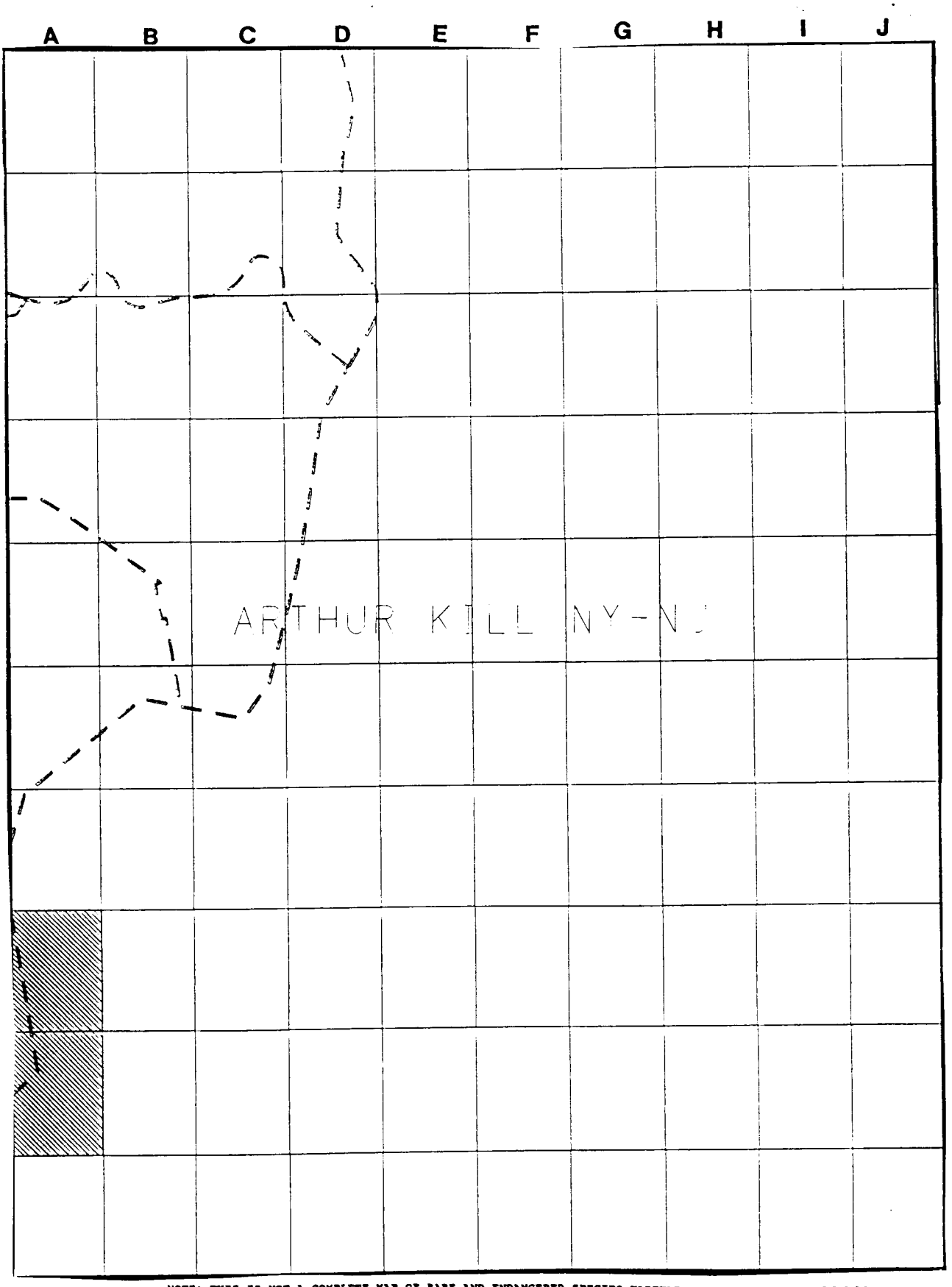
LINDEN
GARFIELD
Port Reading
WOODBRIDGE
RICHMOND
Great Kills Harbor
ARTHUR KILL N.Y. - N.J.

NATURAL HERITAGE DATA

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

DOCUMENTED LOCATION KNOWN PRECISELY

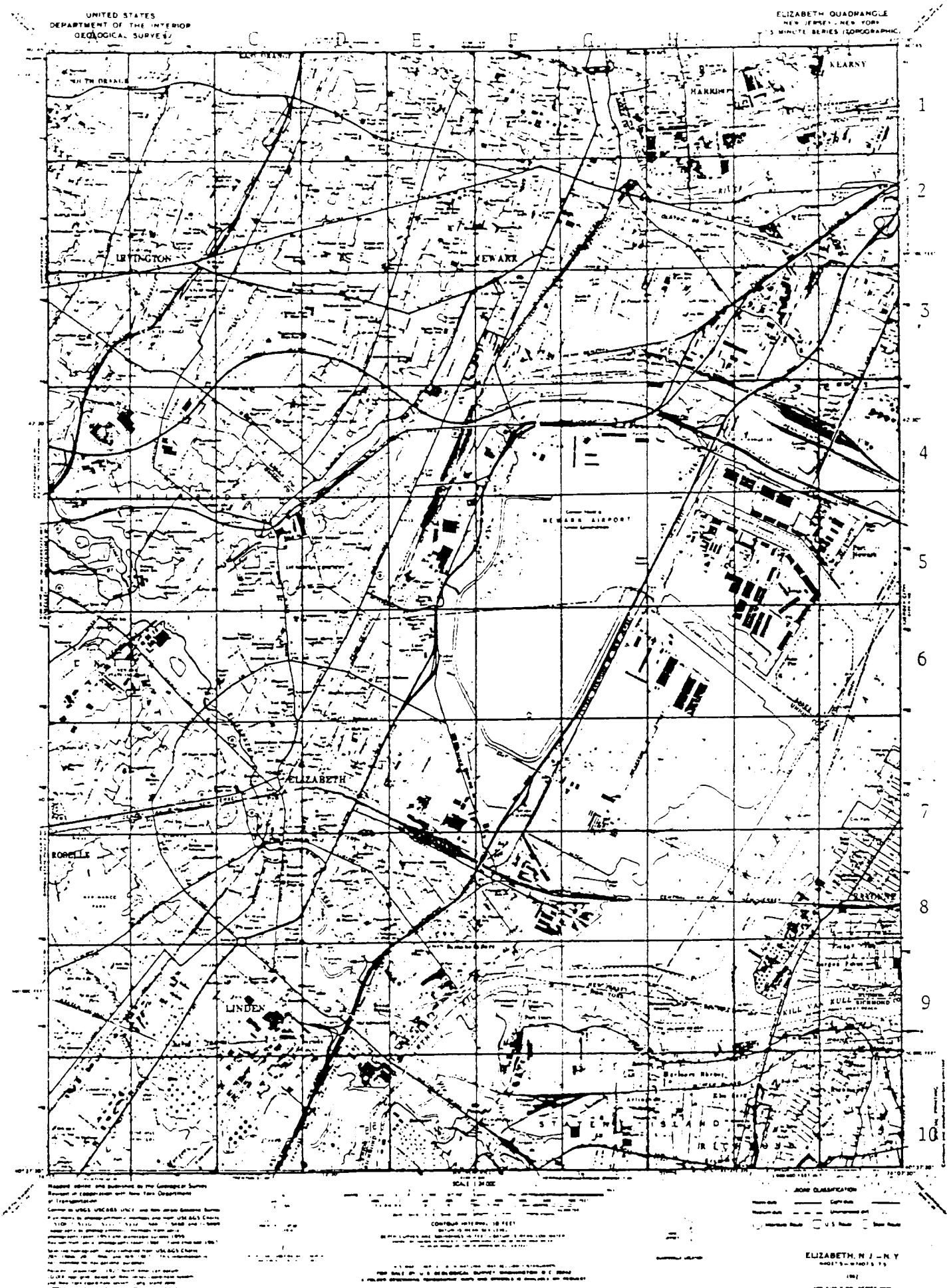
DOCUMENTED LOCATION KNOWN WITHIN 1.5MI.



NOTE: THIS IS NOT A COMPLETE MAP OF RARE AND ENDANGERED SPECIES HABITAT FOR THIS AREA. IT REFLECTS DATA ON KNOWN OCCURRENCES COMPILED AS OF THE ABOVE DATE. IT INCLUDES BOTH HISTORICALLY AND RECENTLY DOCUMENTED OCCURRENCES. ADDITIONAL OCCURRENCES MAY BE FOUND ON UNSURVEYED HABITAT. FOR MORE INFORMATION, CONTACT THE OFFICE OF NATURAL LANDS MANAGEMENT, CN404, TRENTON NJ 08625.

MAY 1988

UPDATED SEMIANNUALLY


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ELIZABETH QUADRANGLE
NEW JERSEY—NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)
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KEARNY
HARRISON
LIVINGSTON
NEWARK
NEWARK AIRPORT
ELIZABETH
BOROUGH
LINDEN
STATEN ISLAND
SCALE 1:24 000
ELIZABETH, N.J.—N.Y.

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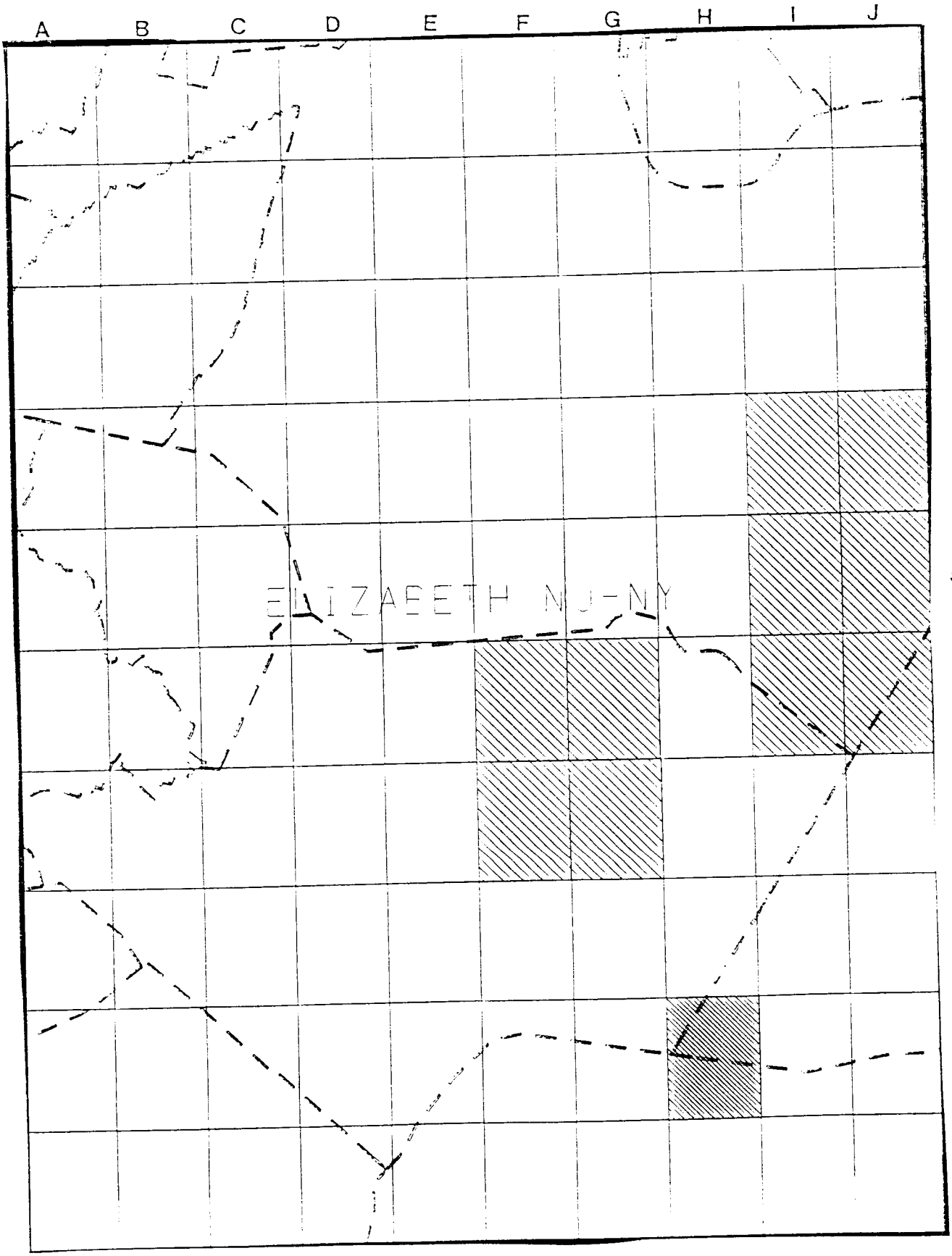

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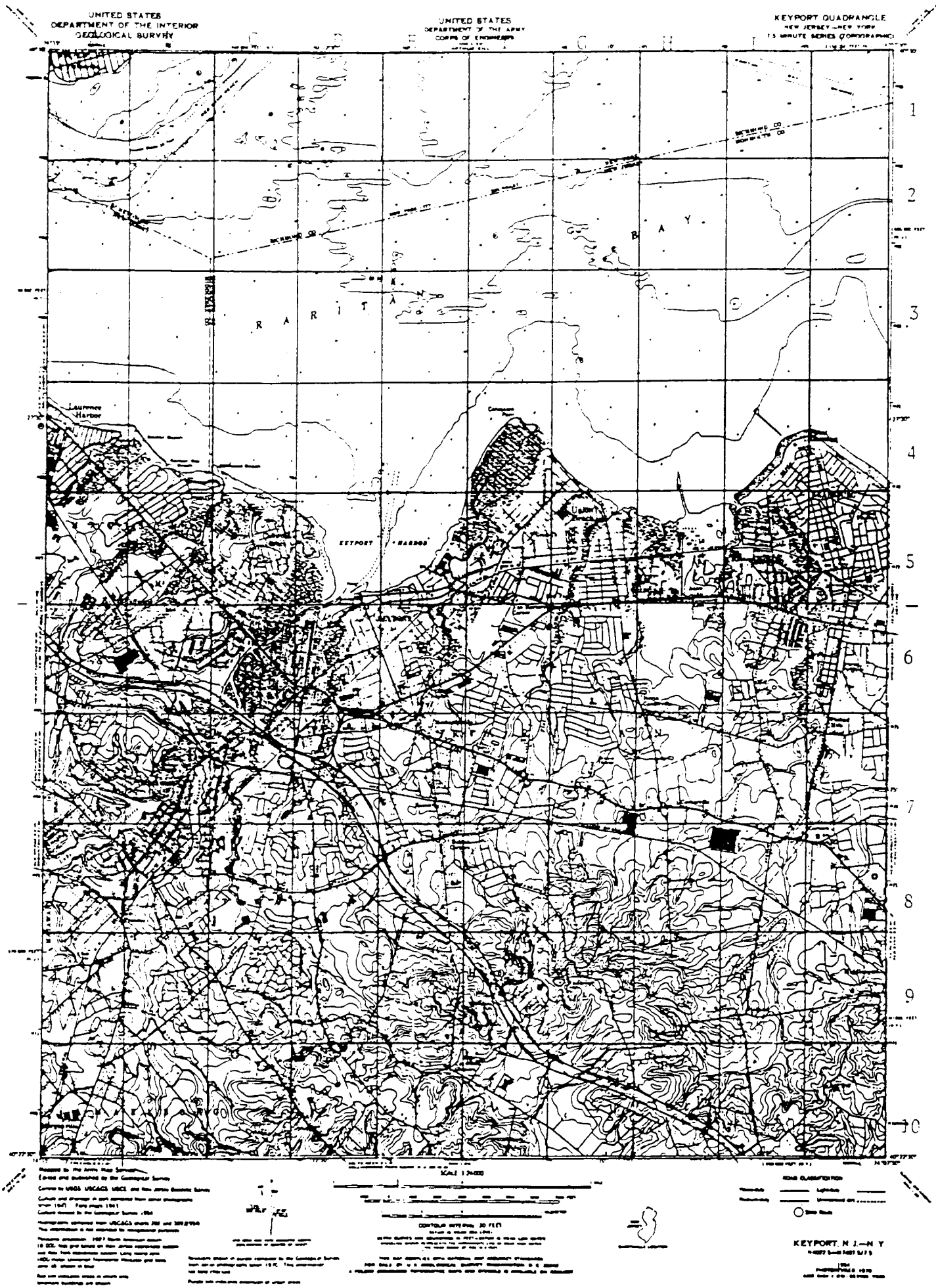
MAY 1988

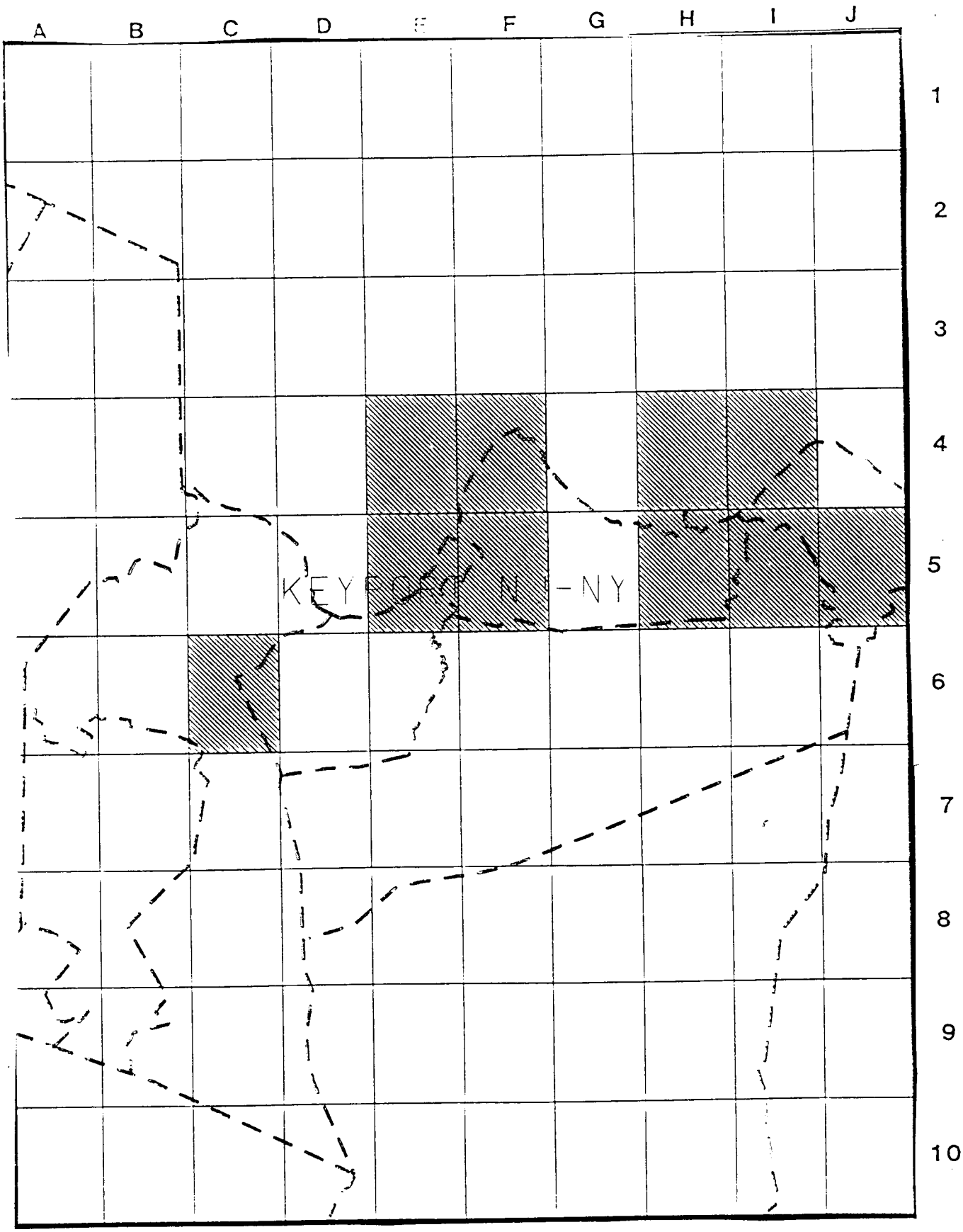
UPDATED SEMIANNUALL


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
KEYPORT QUADRANGLE
NEW JERSEY-NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)
R A R I T A N
B A Y
Laurence Harbor
KEYPORT HARBOR
KEYPORT, N.J.—N.Y.

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

DOCUMENTED LOCATION KNOWN PRECISELY

DOCUMENTED LOCATION KNOWN WITHIN 1.5MI.



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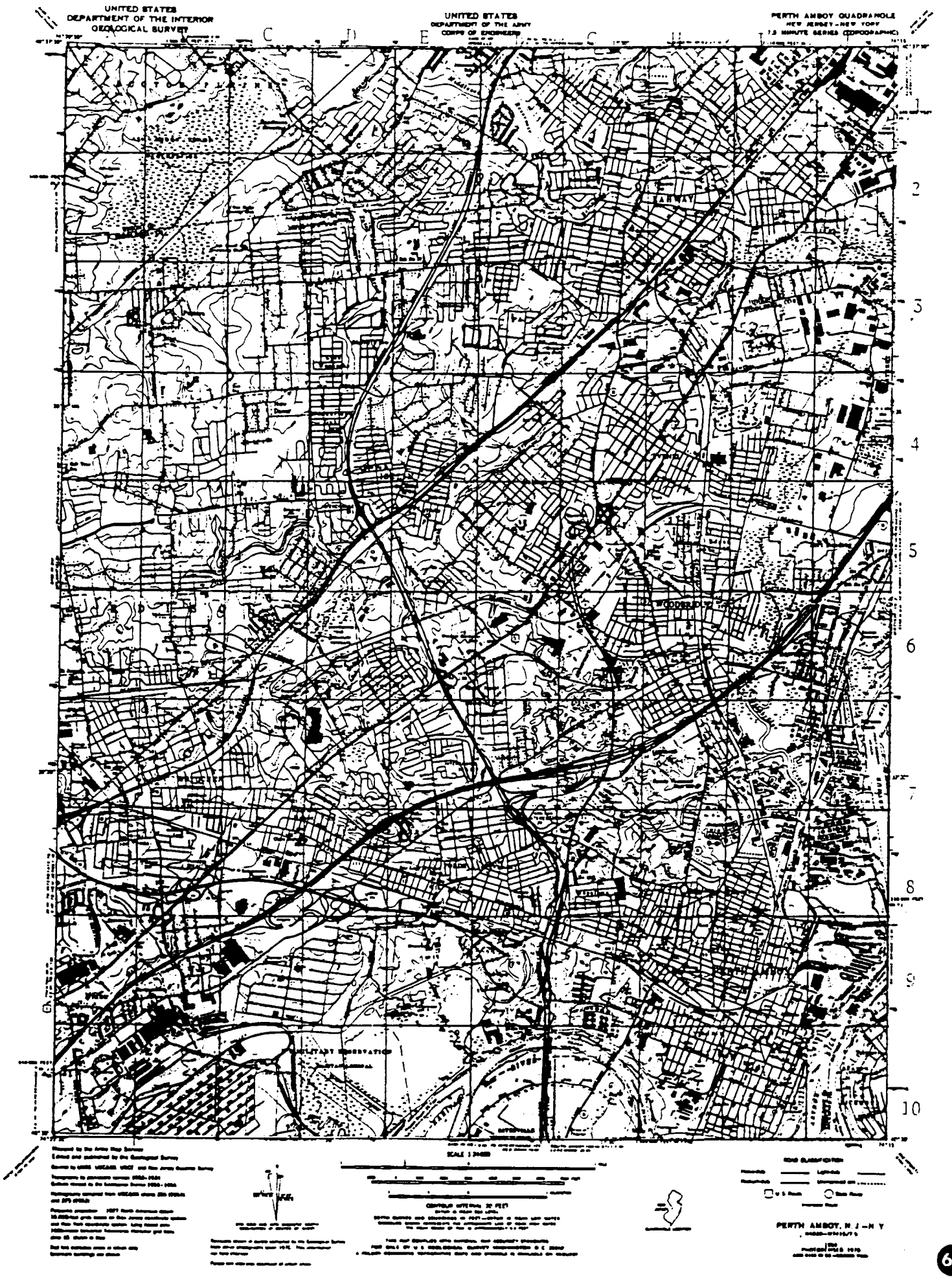
MAY 1988

UPDATED SEMIANNUALL


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
PERTH AMBOY QUADRANGLE
NEW JERSEY-NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)
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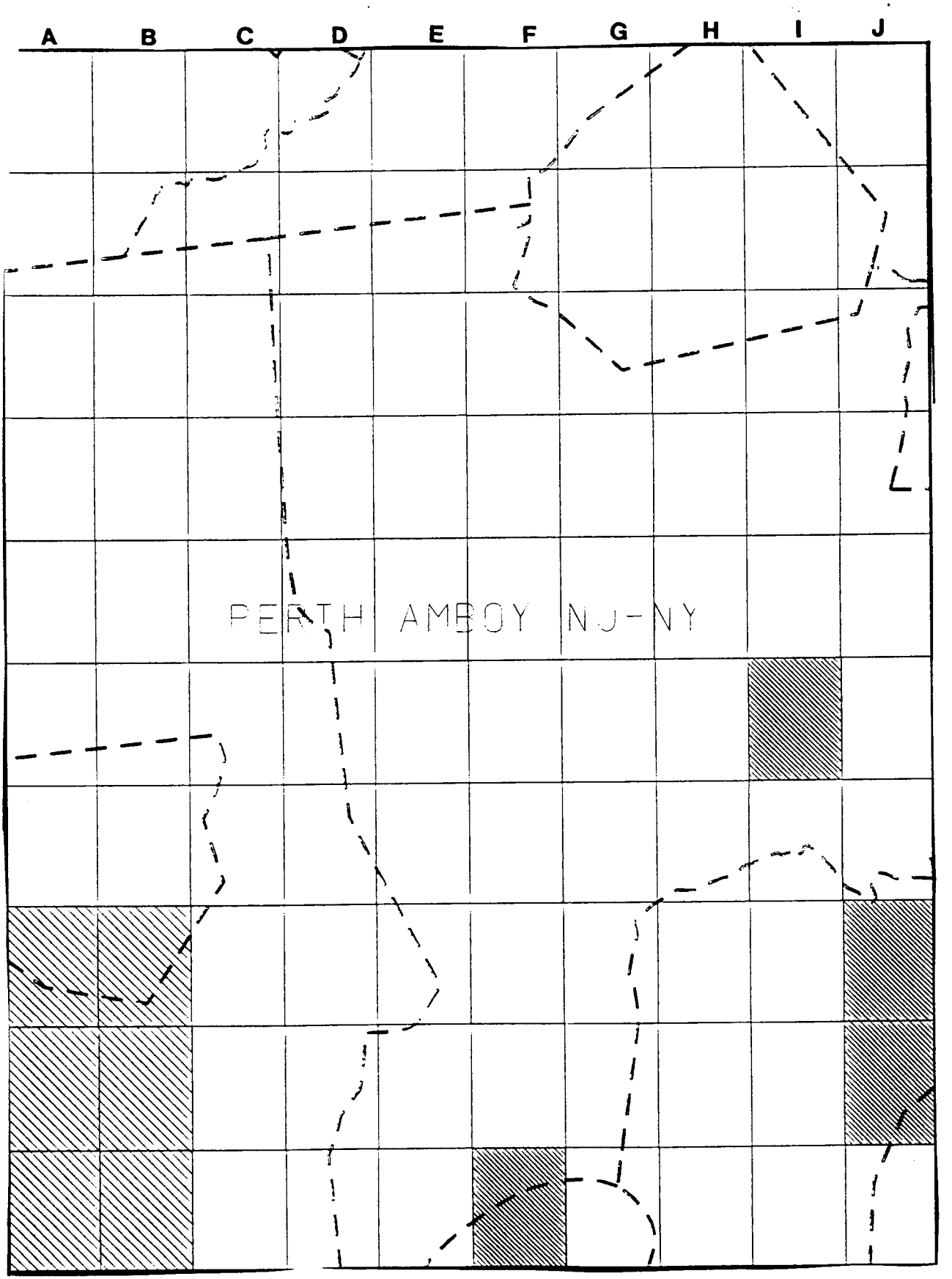
PERTH AMBOY, N. J.—N. Y.

NATURAL HERITAGE DATA

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

DOCUMENTED LOCATION KNOWN PRECISELY

DOCUMENTED LOCATION KNOWN WITHIN 1.5MI.



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MAY 1988

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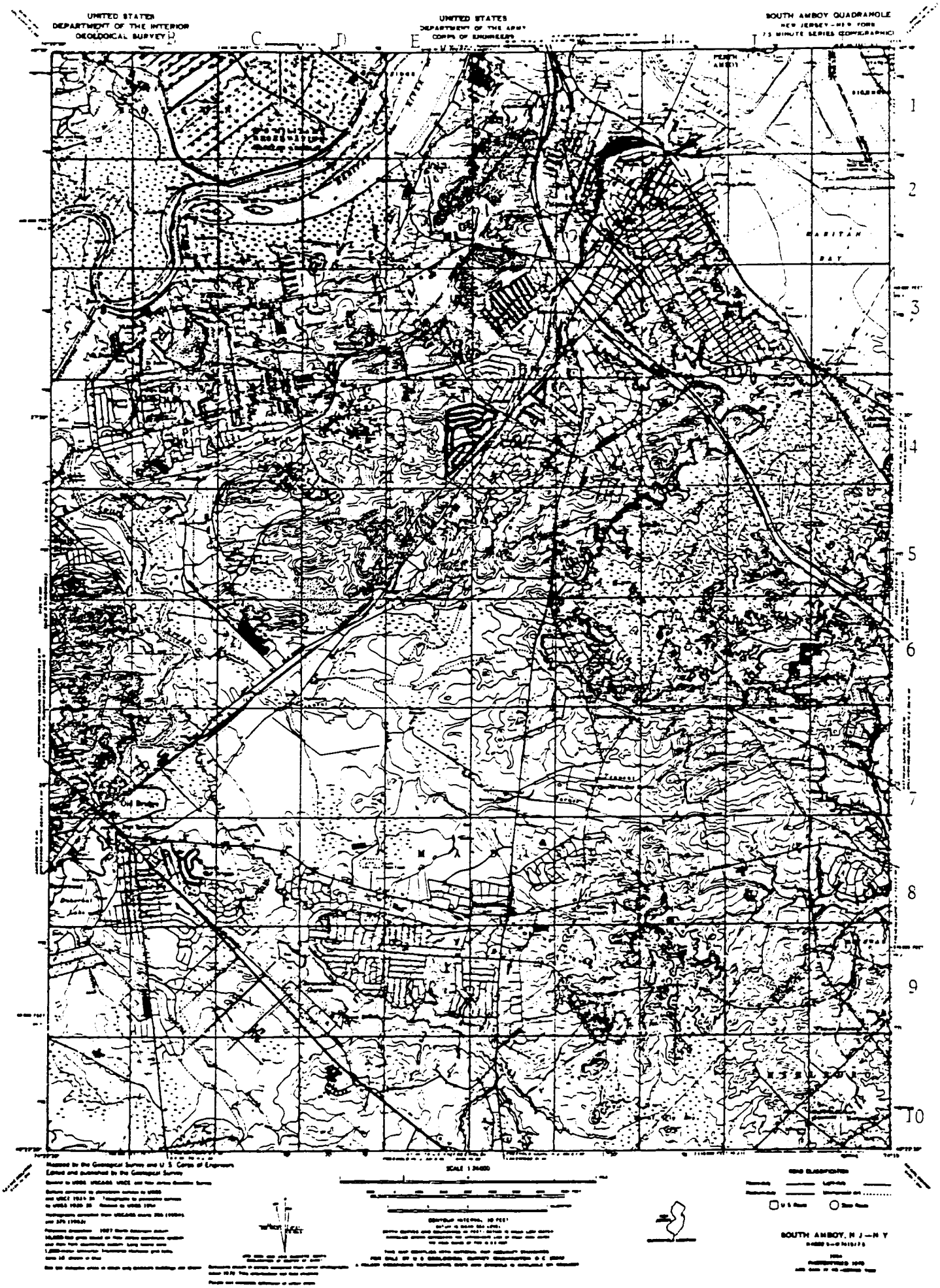
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SOUTH AMBOY QUADRANGLE
NEW JERSEY—NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)
PERTH AMBOY
RARITAN BAY
SCALE 1:24000
SOUTH AMBOY, N.J.—N.Y.

GENERALIZED LOCATIONS FOR RARE & ENDANGERED ELEMENTS OF NATURAL DIVERSITY

DOCUMENTED LOCATION KNOWN PRECISELY

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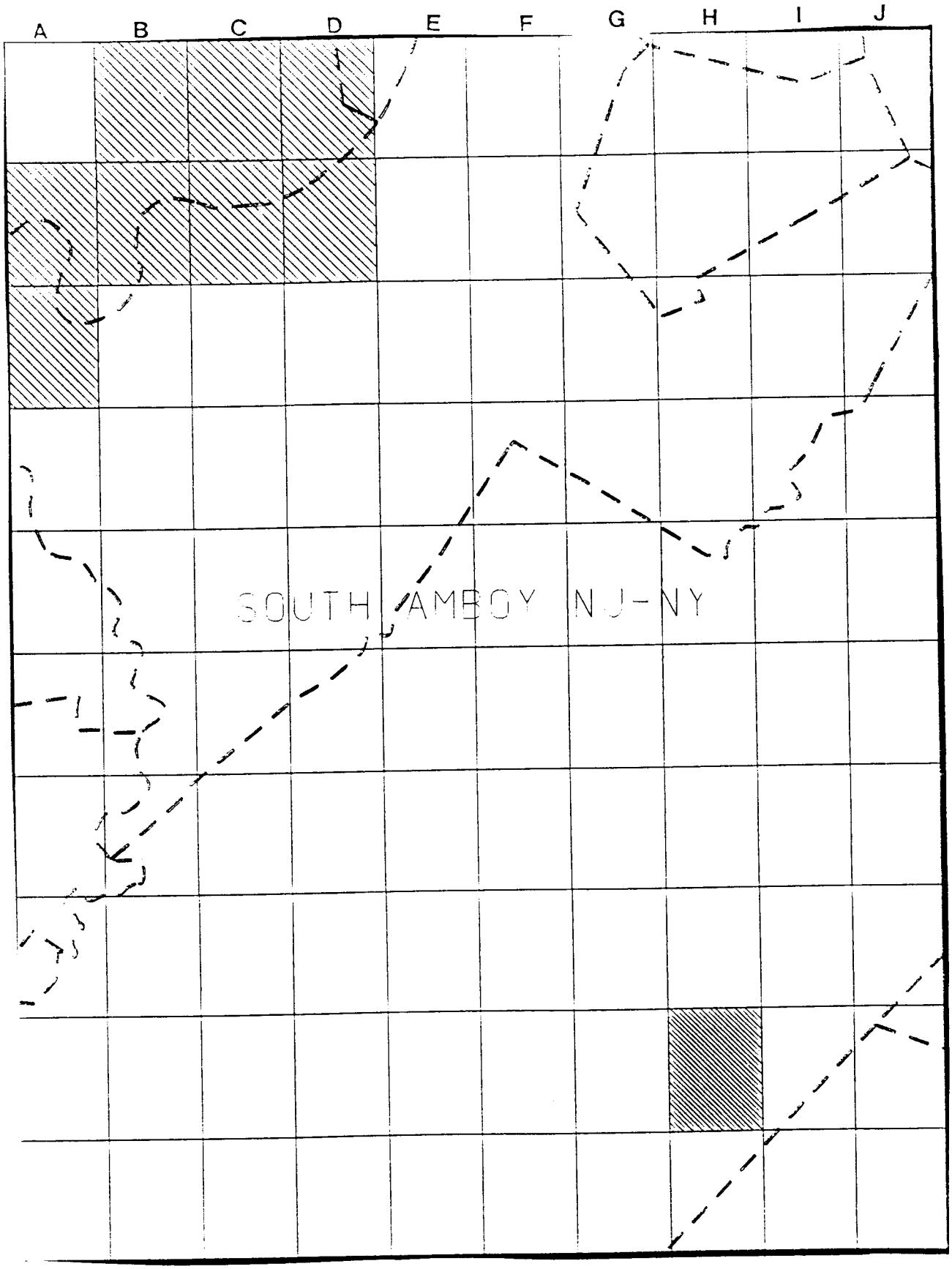

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MAY 1988

UPDATED SEMIANNUALL

REFERENCE NO. 17

FROST ASSOCIATES

P.O. Box 495, Essex, Connecticut 06426
(203) 767-7644 Fax (203) 767-7069

Sep 2, 1993

To: Jan Holderness
Roy F. Weston Inc
4th Floor Raritan Plaza
Edison, New Jersey 08837-3616

Fr: Bob Frost
Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Elizabeth Coal Gas Site
Elizabeth NJ NEW YORK PORTION

Job: 04200-016-081-0062-02

CERCLIS: NJD981082902

Site Longitude: 74.208893
Site Latitude : 40.658051

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the in cluded Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 population and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Coal Gas Site No. 2
th, Union County, NJ
082902
ORK PORTION

========== Site Data ==========

Population:	30749.18
Households:	11323.64
Drilled Wells:	0.00
Dug Wells:	33.74
Other Water Sources:	10.00

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	25865.27
Households:	9382.59
Drilled Wells:	0.00
Dug Wells:	10.67
Other Water Sources:	8.74

** Population On Private Wells: 29.41

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	4671.76
Households:	1823.07
Drilled Wells:	0.00
Dug Wells:	15.12
Other Water Sources:	1.26

** Population On Private Wells: 38.75

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	212.16
Households:	117.97
Drilled Wells:	0.00
Dug Wells:	7.95
Other Water Sources:	0.00

** Population On Private Wells: 14.29

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

Coal Gas Site No. 2
, Union County, NJ
2902
K PORTION

Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

** Total Population On Private Wells: 82.45

FROST ASSOCIATES

P.O. Box 495, Essex, Connecticut 06426
(203) 767-7644 Fax (203) 767-7069

Sep 1, 1993

To: Jan Holderness
Roy F. Weston Inc
4th Floor Raritan Plaza
Edison, New Jersey 08837-3616

Fr: Bob Frost
Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Elizabeth Coal Gas Site
Elizabeth NJ

Job: 04200-016-081-0062-02

CERCLIS: NJD981082902

Site Longitude: 74.208893
Site Latitude : 40.658051

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

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Coal Gas Site No. 2
ch, Union County, NJ
1082902

========== Site Data ==========

Population:	261062.30
Households:	99698.39
Drilled Wells:	159.00
Dug Wells:	0.00
Other Water Sources:	69.00

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	89231.73
Households:	34311.09
Drilled Wells:	19.02
Dug Wells:	0.00
Other Water Sources:	13.02

** Population On Private Wells: 49.47

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	57596.98
Households:	22333.92
Drilled Wells:	23.00
Dug Wells:	0.00
Other Water Sources:	9.98

** Population On Private Wells: 59.30

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	63291.49
Households:	24534.82
Drilled Wells:	80.04
Dug Wells:	0.00
Other Water Sources:	24.56

** Population On Private Wells: 206.47

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	37482.45
Households:	13635.89
Drilled Wells:	15.02
Dug Wells:	0.00
Other Water Sources:	18.44

** Population On Private Wells: 41.30

... Coal Gas Site No. 2
...th, Union County, NJ
...1082902

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	10678.86
Households:	3879.45
Drilled Wells:	19.57
Dug Wells:	0.00
Other Water Sources:	3.00

** Population On Private Wells: 53.88

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	2780.77
Households:	1003.22
Drilled Wells:	2.35
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: 6.50

** Total Population On Private Wells: 416.93

REFERENCE NO. 18

WESTON
MANAGERS DESIGNERS CONSULTANTS

0053N

PROJECT NOTE

C J Serbe
Originator

TO: Elizabeth Coal Gas Site #2 File DATE: 11/1/93

FROM: C. Serbe W.O. NO.: 04200-016-081-0062

SUBJECT: Calculations for population rings using Frost Assoc. data

NOTES: In order to calculate the populations for both NJ + NY portions of each distance ring and the entire 4-mile radius, the following steps were taken:

Ring	NY Portion		NJ Portion		Total per ring		Readjustment
4-3mi	25865	(+)	89,231	=	115,096	≈	115,100
3-2mi	4671	(+)	57,597	=	62,268	≈	62,270
2-1 mi	212	(+)	63,291	=	63,503	≈	63,500
1-.5mi	0	(+)	37,482	=	37,482	≈	37,480
.5-.25mi	0	(+)	10,679	=	10,679	≈	10,670
.25-0mi	0	(+)	2,781	=	2,781	≈	2,780
			TOTAL		291,809		291,810